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ATHLETIC JOURNAL

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April, 1942



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Track for High School Beginners

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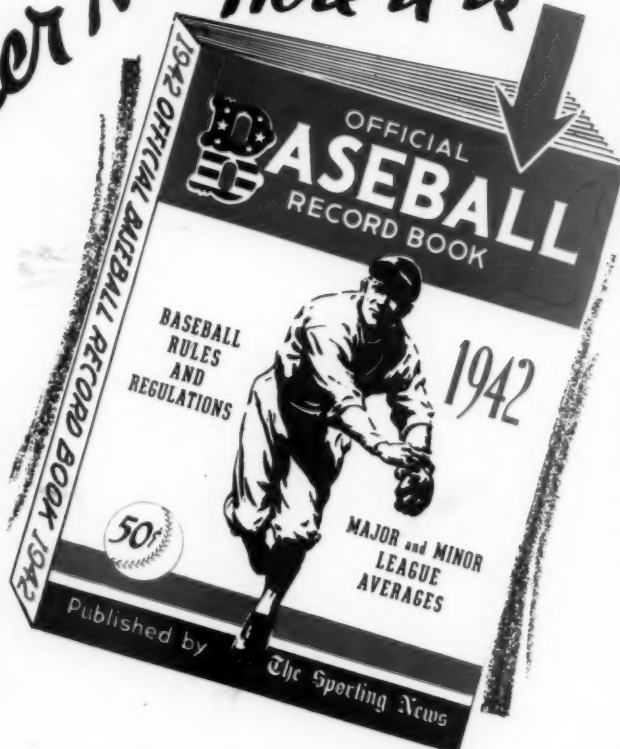
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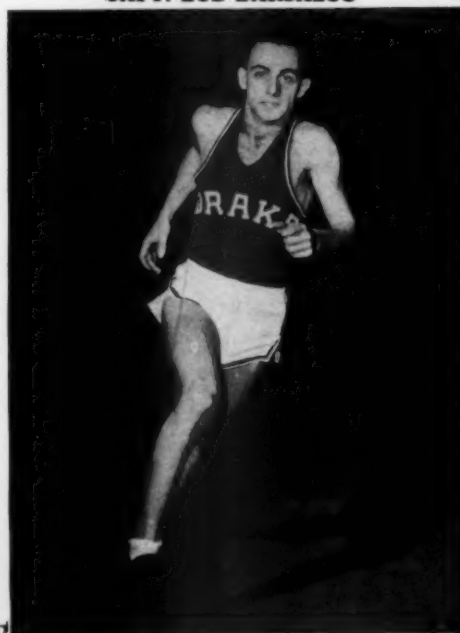
The Relays will be held A 2500 athletes from the count colleges, and Iowa high sc

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John L. Griffith**
**Director
M. E. (Bill) Easton**

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RD Annual

RELAYS

SATURDAY

APRIL 25

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AGAIN WELCOME—
AND DRAKE RELAYS



M OF EVENTS

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880-yd. Relay, One-Mile Relay, Sprint Medley Relay, and Two-Mile Relay. Special One - Mile Relay for Iowa university and college freshmen.

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Pictured at right is Bob Ufer, Michigan's junior track ace. A native of Pittsburgh, Ufer holds the Big Ten indoor quarter-mile championship and also the world's record for the indoor quarter-mile of :48.1. He is one of the most versatile performers on the Michigan track team.

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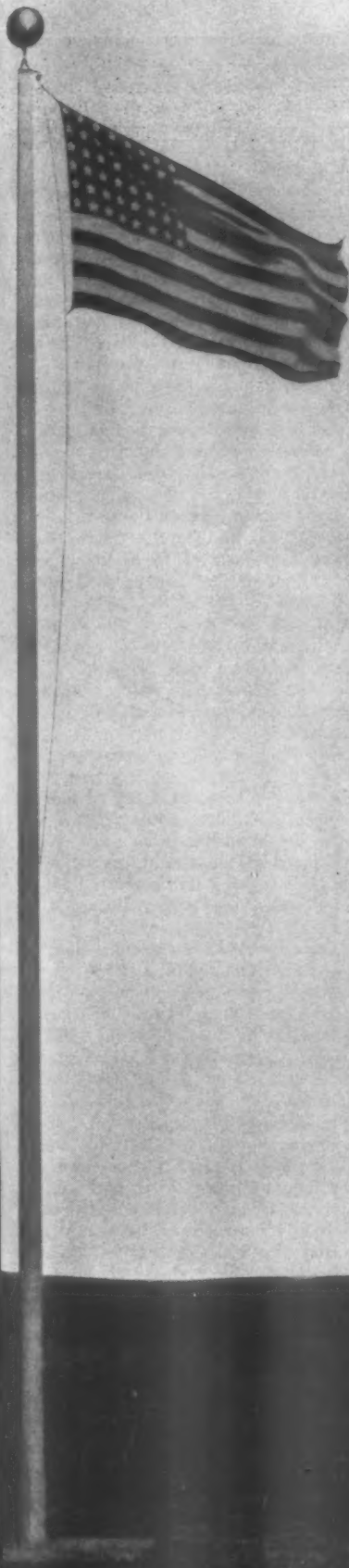
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What the Schools Are Doing

Basic Plan of Operation for War Conditioning Course

By **L. Theo Bellmont**, Director
Ed Barlow, Instructor

Department of Physical Training for Men
University of Texas

Broad General Plan

Purpose: To condition young men of university age in a comparatively short period of time. The course is set up on a twelve-week basis, with three, one-hour workout periods each week. It is scheduled from four to five and five to six P. M., in order not to interfere with laboratory work.

Method: Consideration of the need for strengthening the heavier muscle structures of the body without overemphasis upon any part led to the following general daily plan:

5 to 10 minutes warm-up and calisthenics (described in detail later).

10 to 15 minutes instruction and work in the listed activities.

10 to 15 minutes work in competitive exercises and modified games.

5 to 10 minutes work on barricade course.

or 5 to 10 minutes work on steeplechase course.

Occasional short period of breathing exercises. Stress is on proper breathing throughout all the work rather than the use of any special breathing exercise.

The work is graduated so that an easy workout falls about every sixth meeting of the class. The determination of the amount of the work given is something that must be solved in each particular case.

Ten-minute lectures are given about once every week in which proper eating, drinking and living habits are emphasized. Plenty of food, plenty of liquids, plenty of rest are the main themes. They are not lectures upon morals, but upon the physical welfare, the mechanics of the body. Great stress has been placed upon proper elimination as it is the conviction of the department that "The alert brain and the regular bowel maketh the wise man." Slogans such as "A meal in, a meal out"; and "Remember your bowels, boys. Keep 'em moving" have been very effective as psychological laxatives. The exercises and the suggestions almost compel the formation of regular habits.

Tests: Obviously in a class of this kind

most tests have to be made before the class hour. As valuable as testing procedures may be, we have been forced to reduce them to a minimum. Enough are being made so that we will be able to chart and control progress effectively.

1. The men weigh in before every class. Average gain to date has been around one and a half pounds.

2. Foster cardiac test given in the beginning. To be repeated twice.

3. Strength tests on following charted, to be repeated at intervals:

- Chinning.
- Push-ups (dips) on the parallel bars.
- Grip dynamometer.
- Leg dynamometer.
- Speed on 5 by 20-yard course.
- Speed on barricade course.
- Speed on steeplechase course.

The last three of these tests can be, and are, incorporated into the workout with emphasis upon the competitive angle both from the point of view of the individual and the squad or unit.

Explanations of Workouts Cited in the General Plan

Each workout is planned to give plenty of exercise plus some instruction in one line or the other. As the whole field of physical training was open to us and as we have available excellent men in judo, boxing, wrestling, weight lifting, etc., the problem was one of selection and blending, as well as one of innovation; barricades, steeplechase, grenade throwing, etc.

Calisthenics

The following routine is given at the beginning of every class period. The exercises were selected after a tremendous amount of experiment and elimination. Very little leg work is given. This was omitted because it was felt that leg exercises were being stressed in the rest of the program.

1. **Limbering-up:** Stretching exercise with arms over the head, swing down and under, and up and back as far as possible.

2. **Hop-straddle:** The count for this well-known exercise is varied from very slow to very fast and then back to very slow to develop reaction response and coordination.

3. **Push-ups (leaning rest):** To concentrate on the whole pectoral girdle where the greatest weakness was. Ten times the first day and increased until twenty-five are the daily number now

after four weeks of work. To build up to thirty repetitions as a maximum.

4. *Leg lifts:* Flat on back, hands palm down under the buttocks, legs together and straight, toes pointed. At count raise the legs until at right angles (only) to the trunk. At *down*, legs down until heels three to four inches from the floor. The number of repetitions of this exercise are held static at thirty-two. This seems to be the optimum number. (Note. The above method of counting, i.e., one, down, two, down; three, down, etc., is not orthodox, but it is valuable in that it gives the instructor and the men an accurate and constant count of the number of times each exercise is performed.)

5. *Body lifts:* Body flat on back, arms extended above head and on floor. At count lift and swing with the arms and shoulders reaching for the ankles with the hands. At *down*, back to the original position. This is repeated fifteen times.

6. *Neck exercises:* The neck is neglected in most physical training work with the exceptions of wrestling and weight lifting. For the first three meetings of the class, the men were paired, each in turn offering resistance with his hands to the movement of the other's head; ten pushes, ten pulls and ten to each side. This method was effective, but consumed too much time and it was not possible to control the amount of the pressure. As soon as possible bridging was started. First support with the hands, bridge and roll back and forth. Then hands across abdomen; bridge, stretch, roll, dip, up, down. After two weeks of this the forward bridge was added. The switch from back to front without breaking the bridge has now been added. The amount of this exercise has to be determined by the instructor.

In the time this work has been given an average of one quarter of an inch has been added to the neck of each individual. This, of course, necessitates the buying of new shirts, or the inauguration of the open-shirt policy. The latter is the solution adopted here.

These six exercises represent the total of what might be called formal calisthenics in the class. The number cited in each case with the exception of the push-ups is the number that will be used throughout. They are warming-up, loosening-up exercises. Time averages around seven minutes after they have been learned.

Organization

The organization was made on the basis of the weights of the men. The class was divided into four units, each with the total weight—we call it fire-power—of each unit approximately the same. This classification on the basis of weight only has worked out surprisingly well. We have within each class four well-balanced units, each within close competitive range

of the other, regardless of the type of activity presented.

Each unit has a flexible number of men depending upon the daily attendance; the work is on a voluntary basis; but the main body of each squad, leader, etc., is fixed. The attendance has been 98 per cent which is indicative of the spirit of the men taking the work. The units should not exceed twelve nor be less than six. More than twelve makes for the loss of time; less than six makes for difficulty in the planning and execution of competitive work. Leaders are designated by the men themselves. All men must know the names of all the other men in their own squad by the end of the first week. This is important from the point of view of morale.

Activities

Activities were chosen for specific purposes. Learned skills were then combined as far as possible into some co-operative or competitive work.

Before any work was given in any of the special fields, basic instruction in the proper ways of falling and rolling was given to enable the men to protect themselves. No man in the class knew how to fall or roll on the first day. They fall and roll now from force of habit and the law of the survival of the relaxed.

Barricade Course: This course was adapted from various like courses used in army work. It is laid out on a flat some ninety yards long and forty yards wide. The course is one hundred and fifty yards around and involves the use of all the muscles in pulling, lifting, jumping, balancing and adjusting. Once around at a walk, and then at a trot gave sufficient workout on this course for the first day. We are now running competition over the course.

This barricade course represents the finest adjunct possible to a course of this kind. It is flexible in its use, great in its demands upon stamina and muscle, yet is very interesting to the men.

As the work progressed, more and more work was given to the men, the idea being to give them all the work that they thought that they could take and then, give them a little bit more. A great deal more work may be given with good results than is generally supposed. As more work is added, variation is needed. In instruction the idea was to give work that could be combined with work that had already been given so as to reduce the time spent in instruction and get a cumulative effect rather than the effect of learning a group of unrelated things, simply to build up the strength of the body.

Judo: Simple principles; holds, and falls given and practiced to perfect technique. After the fall was learned wrestling on the mat was added. That is, the most effective judo hold to get a man down

was used and from there on out the thing became a catch-as-catch-can wrestling bout. Simple and effective actions, not necessarily legal holds and tricks are taught. This combination of wrestling and judo thus is capable of combination into the thing we call brawling or localized mob-violence. Two or more men are pitted against one. This, of course, is not fair, but the thing the men are preparing for, is, by definition, not fair. This sort of thing is very instructive, particularly to those men who have never engaged in such delightfully educational pastimes as fighting, brawling and the like. The men are protected and "dirty" punches are not delivered, but they know where and how those punches are delivered.

Boxing: Basic instruction on how to hit correctly; where to hit with the most effect. Work on the heavy bag is given until the men know what it is to be arm weary. Boxing between the men has not and probably will not be given because of the danger to the hands, teeth, eyes, etc. Many of the men enrolled in the course are candidates for the Air Corps and we are acting under the advice of that branch of the service in eliminating this sport as such from the work.

Weight lifting: Graduated work with the five-pound dumb-bells, and the bar bells with emphasis again upon the arms, hands, shoulder and back muscles. This weight-lifting routine work is used sparingly as it is sheer drudgery to most of the men, and offers nothing much that cannot be obtained in other ways. Whenever possible, the weight of the man's own body is used as the resistance. For special cases the weight lifting is invaluable.

Tumbling: Work on parallels, horizontal bar for chins and dips. Work on mat designed to give control and flexibility. No attempt is made to teach the men to do somersaults, flip-flaps, swings, etc., as that is specialized knowledge of no particular benefit from the point of view of the course.

Swimming: Swimming, as yet, has not been incorporated into the work, but it is to be used later. For those men who know how to swim, hard work on the crawl for distance, power and relaxation will be combined with instruction in scissor and frog kick for carrying loads in the water and life saving. The men will be made to slide into the water rather than dive even from the low bank of the pool. This is in pursuance of our policy to do nothing that might in any way injure any man for any branch of the service. Even diving from a low bank might injure an ear and ruin a good pilot. The Air Corps highly recommends swimming, if care is taken of the eyes and the ears.

Men in the classes who cannot swim are being urged, if possible, to learn in one of the swimming classes. It is obviously impossible to offer elementary instruction

in a course of this kind with the time limit which has been set.

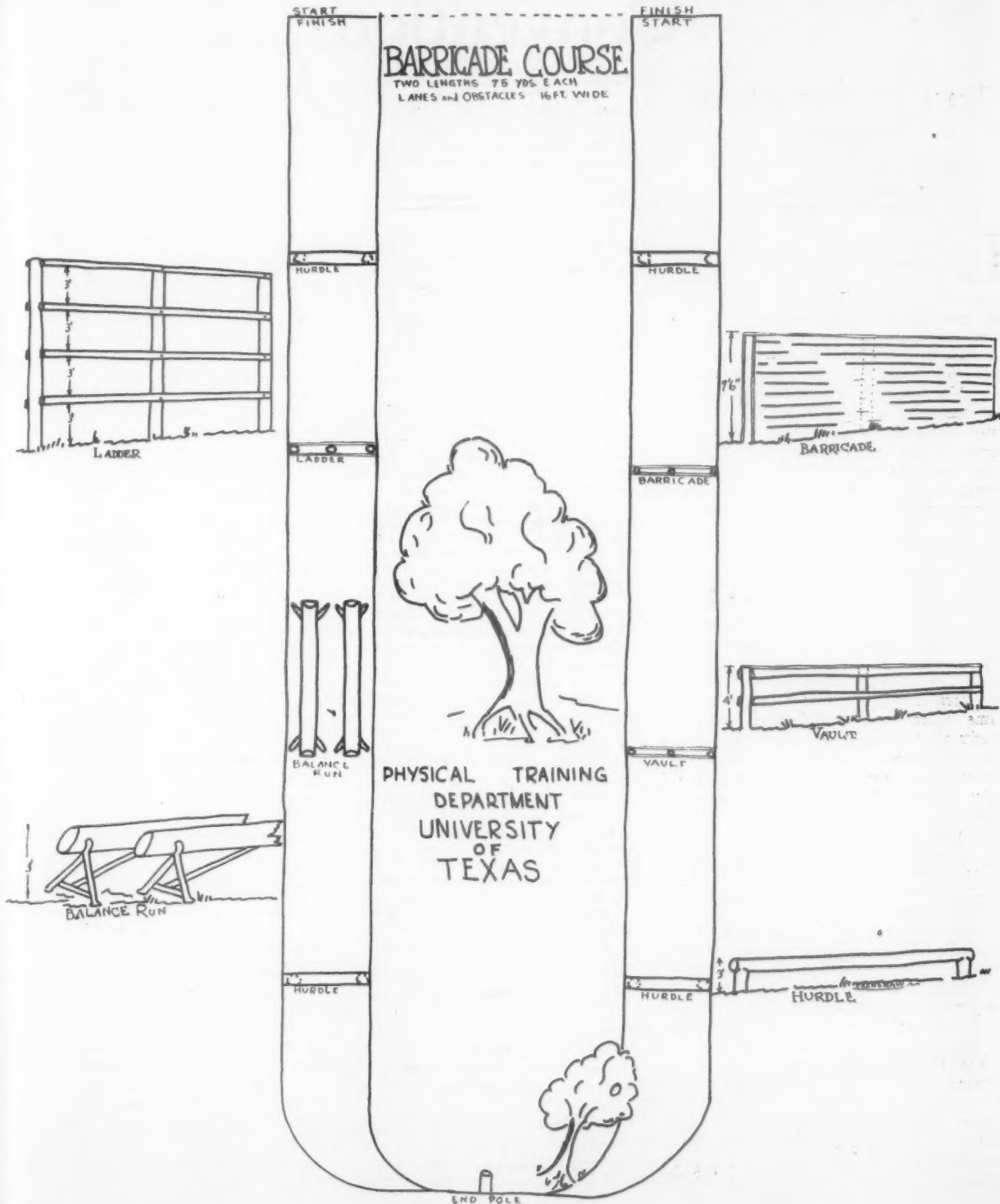
Grenade throwing: Practice for accuracy and distance with dummy grenades, first merely to learn the technique, then incorporated into the body of the course with work as a problem in running, throwing, falling, over obstacles and throwing,

over difficult terrain, etc. Throwing from set marks to be used as preliminary training. Targets set on steeplechase and men run and throw for accuracy and time.

Shooting: The teaching of shooting is not properly a function of a course of this kind. Due to the difficulties we have encountered in setting up a separate

course for shooting, we have arranged to have lectures upon proper shooting technique by Lt. Col. S. N. Ekdahl, a member of the staff of the department, in order to give the men the rudiments of this important portion of a soldier's knowledge. It is our task to condition him so that he

(Continued on page 44)



Notes from the Tenth Annual Track and Field Coaches Winter Convention

Track for High School Beginners

By Chester R. Stackhouse

Assistant Track Coach
University of Michigan

LET me jump right into the middle of this subject by saying that the success of a local or national track program must be measured by the number participating. All coaches think in terms of their star performers and the contests they can win. It will always be this way and there is a place for the star, but in a broader view the star does not need track as much as the lesser athletes in the school. If track will have more thought of the numbers benefiting from participation, the community and nation will benefit and there will be plenty of star performers to make the headlines and thrill the coach's heart.

A discussion of high school track may seem remote from the thoughts of the college coach. In reality, however, it is the life blood of collegiate tracks and the thing that all college coaches might well foster more closely. This is apparent when we note that most collegiate headlines are only high school boys advanced in years slightly. I suspect that these same college men would have posted marks of equal caliber in many cases, had they remained in high school for an additional four years of maturity and been given the same chance for keener competition.

The college coach might do well to pass on a word of appreciation to the high school coach who first dug up this raw recruit and developed in him an interest in track and field, before sending him off to college to make a national reputation for the college coach. I am reminded of the frankly honest remark of a nationally prominent coach in referring to an ace performer on his squad when he remarked that, "It would take a very smart coach to keep that boy from being a winner."

For a more specific discussion of beginning track in high school, we must start with the superintendent. In this relation the coaching profession could bring about some improvement. Too often the superintendent employs an all-American football coach and a basketball celebrity for the cage team and then delegates the

THE article on Straddle Jumping by Don Canham which appeared in the March issue, the article on Coordination of the Movements of Breathing and Running by Albert E. Lumley appearing in this issue, and the articles on Track for High School Beginners by Chester Stackhouse; Sprint Starts by Thomas F. Keane and Something About Long-Distance Runners by Emil von Elling were taken from the talks given at the Tenth Annual Track and Field Coaches Convention. The readers of this publication will be interested to know that Don Canham, author of the article on Straddle Jumping, is now a junior physical director with the army air corps and is at present stationed at Maxwell Field.

No college coach is better qualified to write on the subject of Track for High School Beginners than Chester Stackhouse. The information contained in his article is not based on theory but on actual experience, for he was until the fall of 1939 head track coach at Eastern High School, Saginaw, Michigan, where his track teams won every dual meet for six consecutive years, and were two times winners of the state class A title. Since 1939 Mr. Stackhouse has been Ken Doherty's assistant at the University of Michigan.

With a long list of victories to his credit on the cinder track, Mr. Keane coached at Worcester Academy, the University of Maine and Oberlin before taking up his duties as track coach at Syracuse University thirty-five years ago. In addition to his job of developing Orange trackmen he is commissioner of playgrounds for the city of Syracuse.

The interesting notes—"inside dope" so to speak—on three great distance runners are comments that should be appreciated by every young coach. In his twenty-seven years at New York University, first as assistant track coach, later as head coach, Mr. von Elling, in watching them come and go, is well qualified to pass on to the readers of this publication training items of great value.

supervision of the track squad to anyone on the faculty who will take charge. This may be unavoidable because of the scarcity of competent graduates in the field of track.

There is, however, still a good chance for success, if the new track coach has two qualities: first, enthusiasm and secondly, the desire to learn. Research will uncover a certain knowledge of track tech-

nique which will increase with practice. Then, if the coach has an understanding of human psychology and can acquire a little of the strategy that goes along with competition, he may do a pretty good job coaching track. Obviously the coaching of track with the national leaders is an advanced science but most of them started at the bottom and what some have done others can do a little better.

Probably the preparatory school coach has to be the real coach in much the same way that the kindergarten teacher should be one of the best teachers in the system. There may be college squads in this country where only boys with preparatory school reputations are welcome. On the other hand the young coach finds himself in need of a pole vaulter. There is nothing to do but go out and develop one. This he often must do in addition to teaching a half-dozen academic classes during the day.

Once successful, the track coach faces a danger not found in other sports. The football coach who rests on his laurels is soon gone. With the lazy track coach it is possible to depend upon one or two stars, which every team has, to carry the publicity and reputation of the coach at the expense of the team and, incidentally, of the sport. The coach is the defender of his sport in his community. Likewise, what track has been, and will be, is a direct reflection of the zeal shown by the coaches of America.

The young coach can go into any community knowing that he is selling a bill of goods with real value. I believe track can do for every dollar and hour spent, as much as, or more than, any other sport. This is true in the community or the army.

The number one problem is in promoting interest, but no other sport lends itself to this promotion as readily as track. If enough boys report, success is assured. I believe firmly that for every thousand boys, some will have better than average ability in the sprints, the jumps, the weights and the endurance runs. Fate is no respecter of persons in selecting the birthplace of champions. There are winners in communities of all sizes. The task is to find them and then convince them of their ability. Track men seldom realize their capacity and the coach must never pass premature judgment on the potentialities of the would-be athlete.

(Continued on page 14)

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The ATHLETIC JOURNAL

Nation-Wide Amateur Athletics

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JOHN L. GRIFFITH, Editor

Savior of His Country When the Gun Begins to Shoot

THE nation is today taking stock of all of its resources in terms of our war effort. To attempt to list and classify all of our material, physical, moral, and spiritual resources and values, would be futile, because human beings can only hazard rough guesses concerning such matters, especially when they are based on nation-wide estimates. We may, however, with profit ask ourselves this question—What do we need to have, in order to win this war?

Someone has recently stated that, since the last war, the tendency here in the United States has been to belittle or destroy the qualities which are now needed, if our war effort is to succeed. What are some of the qualities, elements, or activities that have pretty much been attacked or derided in the last twenty-three years?

In the first place, following the last war a large number of our people were convinced that our munitions makers were responsible for our getting into that war. Some broadened the field to include the successful business men and industrialists. The finger of scorn was pointed at the munitions makers, until many of these men abandoned or curtailed their production of munitions. Some of these industrialists converted their factories that previously had been used to manufacture powder and implements of war into the manufacturing of commodities that satisfied civilian and peace-time wants. Today, we are feverishly equipping our factories to the end that they can turn out more and more powder, bullets, guns, planes and tanks.

After the other war, a concerted drive was made against military training in the schools and colleges. Today, we wish our boys had been given more opportunity to prepare themselves for service and leadership in case of war.

Not only are the Army and Navy combing the entire population for college trained men, but industry also is hunting for men with a technical training to help in turning out the equipment that

our men in the ranks need, to enable them to fight successfully.

Anything that savored of military training in the years following the other war up until a year or so ago was more or less taboo. The pacifists who believed that we could avoid another war by scrapping our Army and Navy and by setting an example to the rest of the world, exerted a powerful influence on the government and the people in general.

By way of illustrating how different things are now than they were a few years ago, the press recently reported that General Douglas MacArthur was invited to give the University of Pittsburgh's commencement address on June 18, 1932. The pacifists in the city of Pittsburgh and a few in the undergraduate student body who were led by the National Students League, threatened to break up the meeting, if General MacArthur spoke in the University of Pittsburgh stadium. Some of the university football players and local police, however, prevented any disturbance. MacArthur had been called a militarist by these pacifists. It is hard to believe that any American university and its authorities would be derided today, if that university invited General Douglas MacArthur to speak on its platform.

The pacifists back in those days had a naïve belief that they could outlaw war and, quite frequently, along the side of the country road would be found billboards carrying such signs as "Outlaw War." The pacifists and the left-wingers who claimed to be pacifists for strategic reasons, certainly did discredit the things that we so much need today in our attempt to fight this war to a successful conclusion.

Another change has come about as we, more and more, get wholeheartedly into this war effort and that is a return to the belief that ours is a great country and one that is worth fighting for and worth saving. We do not want to dwell too much on the past, but it is well to remember that some years ago talks about patriotism and the glories of our country, past and present, were not popular. The writer recalls the time when he was asked to uphold the patriotic side of the pacifist question in a debate and the boy who invited him to participate in this debate very frankly and honestly assured him that he would have the unpopular side of the question.

Today, very properly, we are being told about the fighting, heroic deeds of our men and this is fine, but we needed more of that back in the period when it was not considered proper to speak of the flag or the Constitution or the glories of this country of ours. Some people complain that we are too complacent about this war. We have not detected that to an alarming extent, but, if we are complacent, perhaps some of the blame may be laid on the shoulders of those who a few short years ago thought it was not quite proper to develop a patriotic appreciation of our own country in the minds and hearts of our boys and girls. Those of us who were of an earlier generation, after reading our school histories, thought that Washington, Jefferson, Jackson, Lincoln, and others were great Amer-

icans. We thought this was the greatest country in the world and were taught to think of our country as an altar on which to lay a sacrifice instead of a crib out of which to feed.

We are not even attempting to imply that our present generation of young men and young women are unpatriotic. The men in the service have already demonstrated that, given proper equipment, they will more than outfight any opponent that they may go up against. Our boys who are wearing Uncle Sam's uniform have plenty of patriotism. It may be that some of the rest who are now behind the lines have been a bit apathetic, partly because of the wave of revulsion against war that swept over this country following the other war.

We Americans have too much creative genius to sanction the constant practice of warfare in times of peace. War is based on one principle and one principle only, and that is the principle of destruction. The winning army is the one that can destroy the most enemy lives and enemy property without suffering too great losses within its own ranks and in its own country. It would be too bad if all of the nations of the world were so thoroughly militarized that they always had to devote as much attention to war and destruction as is now the case. We agree with those whose ambitions for their children run along lines of creative achievement instead of destruction and carnage. On the other hand, we should be realistic and we are not realistic, if we refuse to strengthen our military and naval forces in times of peace when other nations are obviously getting ready for war. We are not realistic, if we refuse to face the fact that our youth may be called upon to fight a war some day. We are not realistic if we think that we can prevent war by passing resolutions to outlaw war.

As we give some time to questions such as this, those of us who have been engaged in school and college athletic work may properly appraise our efforts, past and present. We know that, in time of war, our Army and Navy must be composed of men who are strong physically; men of courageous hearts who are possessed of a patriotic zeal to do the job that they have to do when called upon. We know, too, that our athletes are among the first to get in when a war comes and that, according to our Army and Navy men, the training that they receive in athletics helps fit them for their duties in time of war. Fortunately, our athletic programs, carried on in times of peace, have helped equip our men for life in times of war, as well as in times of peace. Football men do not become sword rattlers or militarists, because they have engaged in a fighting game, but when they get into the service, they invariably do a good job.

While we are reminiscing regarding these matters, may we be reminded again that our athletes were not part of the pacifist movement and they, having learned in athletics to fight for a cause and to believe that their institution was worth fighting for, likewise have also believed that our country was worth fighting for. In other words, their spirit of patriotism and loyalty was not affected by the elements to which we have previously referred.

"It Is the Barbarians Who Are Always Willing to Die for a Cause."

SOME time ago we quoted Channing Pollock who had stated that, "Physical atrophy is attended by the withering of the spirit, a contempt of moral principles and ideals. It is the barbarians who are always willing to die for a cause, not the civilized people."

This quotation from Mr. Pollock which was printed in the March 1941 Journal might well be scrutinized and considered now in the light of what has happened since this statement was first made. No good comes from calling the people of any nation barbarians but the fact remains that when a people concentrate exclusively on the finer things of life and think only of the life of the spirit, such a people may atrophy and be fair prey to others who still believe in the law of the survival of the fittest.

Certainly at this time some of the nations that are achieving military and naval successes have not been so much interested in the refinements of civilization. In this connection, may we again quote Winston Churchill who once was quoted as saying, "Culture and literature are all very well, but culture without strength soon ceases to be a living culture." We who have had the privilege of living our lives under a free government where we were not regimented and where we could follow the good life without having to devote a great deal of our time to war and preparation for war, realize of course that, if we are going to preserve all of the things that we hold dear, we must now fight for them. We feel that in athletics we have helped in some ways in making America strong and this has been done without any encroachment upon what Mr. Churchill may call our culture. In other words, there has really never been a conflict between physical life and the life of the spirit as we have known it in this country. We have to prove, however, that we can outfight the men who represent a different type of living and a different type of culture from that which we have known. If we cannot outfight them, then our civilization will be destroyed, temporarily, at least.

What we are asking is that our university, college and school officials give the coaches, and all of the men who are engaged in physical training work, a chance to prepare our young men who may ultimately be called to the colors.

The Navy recognizes the value of athletic training in helping to develop dive bombers and aggressive, fighting and resourceful pilots. The Navy also realizes that the same qualities that stand out in a hard fought football game are the qualities that our men need in time of war. If it is important that our air men, sailors and soldiers be given basic athletic training as preparation for what lies ahead, then certainly it is also necessary that our boys who later may be called to finish the fight should have the same kind of training.

Notes from the Tenth Annual Track and Field Coaches Winter Convention

(Continued from page 10)

It has been our experience that the following factors will insure a large squad and thus a fairly good team:

1. The coach should provide an adequate schedule (at least six meets) one year in advance. Track suffers from last-minute scheduling and unwillingness of strong teams to meet each other. How long would football thrive on push-over schedules?

2. With a promising schedule the good will of the press is of utmost value. Boys even more than men are fascinated by their names in print.

3. Much good will come from a bulletin board placed in a conspicuous place where students of both sexes will pass it many times each day. The board will quickly die or flourish depending on its care. The same copy should not be allowed to stay on the board more than two days. Material on the board should cover every phase of track, but names and facts relating to the individual candidates should predominate.

4. Pictures have a magic that must not be overlooked. Action photographs of the candidates are most valuable because of their permanent nature. Pictures of national celebrities are inspirational. Slow motion pictures are best for assembly showings and individual technique study. The expense is never an obstacle as the squad will gladly chip in to pay the expense.

5. All-time record boards placed in as prominent positions as the bulletin boards are essential and should be kept strictly up to date.

6. The successful promotion of track eventually requires good equipment. The careful cleaning and repairing of uniforms will soon assure an adequate supply for a large squad. The care of the track and pits should be carefully and artistically done, even if the coach must do it himself. The boys will willingly help and probably appreciate things more, if they are given a chance to do so.

The foregoing efforts should provide an adequate squad. With two or three hundred boys reporting, the coach must proceed carefully the first two weeks, or he will lose valuable talent before he discovers the ability of his candidates. To prevent this the coach should have a meeting at which the following facts are stressed in an unburied manner:

The candidate must not think of discouragement or pass judgment on himself for at least one month during which time he will gradually approach condition.

Some younger boys will think of success in two or three years. Most good teams are in the process of development for three

years.

No one can know what event is best suited to any particular boy. Therefore all candidates should try all events.

The candidate must expect to be clumsy and must never be embarrassed by first comical failures.

All squad men (especially veterans) should be encouraged and never discouraged.

The coach hopes to have the perfect trust of all candidates.

All candidates have the same color as far as the coach is concerned. He never knows their religious background or the amount of money their father has.

Competition should be slight at first and then of an even nature so as not to discourage beginners. Success builds courage and repeated failure makes a coward.

Younger candidates must not compare their performances with older men.

The candidate should keep a record of his efforts so that he may take encouragement from his progress in much the same way as a golfer enjoys his score.

In the practice session some method must be devised, whereby every boy receives some individual attention each day. With several hundred boys one coach cannot do this without the help of his veterans on the squad. These older men profit in their own technique, when asked to instruct beginners, so all are helped by such a plan.

In early sessions we assign the lettermen around the gymnasium floor or track like numbers on a clock. They represent most of the events in track. To begin with, each man has a group for a five-minute lecture on his special event. When the whistle blows all squads move clockwise on to the next man. After fifty minutes every boy on the squad has had preliminary instruction in all events and probably from some proven athlete he has admired. In addition, this promotes democracy on the squad which is most desirable.

We always encourage the older boys to find a protégé in their neighborhood, a boy whom they will encourage to fill their shoes after graduation. Then, we try to give credit for the new star's success to the man who discovered him originally.

The coach should avoid the know-it-all attitude and should encourage his men to read everything they can find on their event as well as to carry on experimentation in practice sessions. As competition nears, the experimenting should cease and, of course, it is hoped the boy will always value the suggestions of his coach.

In determining the events for which boys are best fitted, we have used different procedures. In the high jump, low

hurdles, broad jump and sprints we have encouraged all boys to participate in a follow-the-leader method in rapid succession. The boys with obvious abilities soon show themselves. It is important that the high-jump bar be at no more than three feet and that the low hurdle is used on the sod or mats. Sprinting should be at twenty yards and not of the racing type. Endurance men show their abilities later in the season.

With the shot and pole vault we have tried to prepare in advance for this interest. A distribution of rug or light-weight bamboo poles in any community will usually produce pole vaulters one year later. All heavier boys are anxious to try their prowess in the shot and an invitation is usually all that is needed for a start. The rest is hard work and encouragement. If the school has a foundry it is easy to have enough shots poured so that they may be scattered in every corner of the city throughout the summer.

For the enthusiastic coach the hurdles, shot, and pole vault should offer the easiest point for the simple reason that many of his competitors will not go to the trouble to coach these events.

Boys will enjoy their sport more if they consider it a science. Team spirit is fundamental. Meets should be mapped in advance as to strategy. Each boy should know the points he must score for the success of the team. It is important that a man who can score only a third place not try to place first in a race like the mile, etc.

Track coaching takes a great amount of time, much enthusiasm, a love of boys, and a building-for-the-future plan, but the thrill of watching awkward beginners unfold into topnotch performers as a cocoon opens into a butterfly, more than pays any coach for the effort he puts into his job.

Sprint Starts

By Thomas F. Keane

Track Coach, Syracuse University

IN all of my talks on sprinting and starting, I have invariably used a high school or university athlete for demonstration purposes. By this means, I can set him into the position which, in my opinion, is the best for starting. Naturally, I have had experience with many different types of starting, and have found the one that I shall describe to be the best method of all. On practically every occasion that I have used a model and let him set himself, I have had occasion to change his style to meet the one I am going to try to explain to you.

As coaches, you will note that many

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boys who come to you are so far over the mark when they "set" that they are entirely off balance. The first thing to do, therefore, is to get a pair of holes to fit the boy. Only yesterday, I measured the distance from the starting line to the back of the first starting block, and it was 14 inches to the back of the starting block. The rear block was 34 inches from the line or 20 inches between the two blocks. This applied to one particular man. With another starter the distances were 13 inches and 31 inches, or 18 inches between the blocks. These distances vary with the height of the boy.

Many coaches hesitate to let the boy have his starting hole so far behind the starting line. They seem to feel that this is lost distance. This is not so, because if a man is set properly from the distance I have mentioned, the leverage will be almost perfect. In other words, his back will be almost on a straight line and not crouched from the rear, as so many runners are. In starting with a new boy, I usually let him put one knee on the ground with his hands on the mark, and then lift him up myself until I get his back about level and then let him advance forward, until he begins to feel the

weight on his arms, which should be perfectly straight. He can adjust himself, if he is too far over or not quite far enough. This will come to him after he has practiced this particular type of starting for a little time. Coaches will often find, if their boys set their holes this way, that they will get out of the holes with much more power than is usually the case.

I am a "power" coach and have always felt that too much time is wasted by boys before they begin to get any real power into their starting. They usually run ten yards, before they really get under
(Continued on page 35)

Baseball Illustrated

Sliding and Baserunning

Illustration 1. The baseman here apparently has little time to make the play.

Illustration 2. The ball is already past the baserunner, apparently coming from second baseman in this instance, and the baseman's right foot is already tagging the bag.

Illustration 3. The ball is already in the glove, the runner still five to six feet away. The baseman has time to get out of way.

Illustration 4. The baseman already has tagged the bag and shoved off to the outfield side as the runner starts to hit the dirt. While the runner may touch him in trying to take him out of the play, unlikely he can spill him entirely as he has gotten away from the bag quickly.

Illustration 5 shows the baseman starting his arm back to throw, the runner almost on top of him.

Illustration 7. The baseman has started the forward motion of the throw soon enough so that, even if the runner cuts him down, he will probably get the throw off accurately.

Illustration 8. The runner has really gone after the baseman here, perhaps even far enough to justify an interference claim, always a tough play for the umpire to decide, since the runner is entitled to that base path on a thrown ball. The baseman is trying hard to jump over the runner's feet as he comes in.

Illustration 9 shows the throw-off. Will the baseman be able to keep his feet?

Illustration 10. He did it.

Illustrations 11 and 12 show the runner approaching the bag. The baseman is set to receive a good throw from the first baseman.

Illustrations 13, 14, 15 and 16 show the runner starting to "hit the dirt." The baseman's left foot is hidden by the runner, apparently on the bag ready for a quick push-off to avoid being cut down. Note how the runner, probably unconsciously, has put his hand on his head to take up the blow, in case the ball hits him in the back of the head.

Illustration 17. The ball is just about to hit the baseman's glove, the runner is beginning to hit the baseman's right leg.

Illustration 18. The runner is all the way "in" on the base. The baseman is making a fine effort to get over him to throw.

Illustrations 19 and 20. The baseman was a fraction of a second too late and has spilled.

For this series of pictures the ATHLETIC JOURNAL is indebted to Lew Fonseca of the American League Film Bureau, 310 South Michigan Avenue, Chicago. The pictures are taken from the new American League film, "The Ninth Inning." This 35-mm. film is available to schools, churches and organizations which have sound projectors. The only obligation is express charges both ways. The prints were secured through the courtesy of the Chicago Film Laboratories.





Intramural Athletics for High School Boys

By E. R. Elbel, Ph.D.
Associate Professor of Physical Education
University of Kansas

WITH the view of securing certain information relative to intramural athletic programs for high school boys, questionnaires were mailed to 417 schools. Samplings were taken from each of the 48 states with an attempt to include schools of all sizes. A total of 342 (80.2 per cent) questionnaires were returned. Replies were received from all states, which in itself would seem to indicate the great amount of interest in the subject.

For convenience in tabulation, the returns from the schools were divided into five classes according to enrollment, as follows:

Group 1 schools below	400
Group 2 schools between	401- 850
Group 3 schools between	851-1500
Group 4 schools between	1501-2250
Group 5 schools above	2251

The number of questionnaires returned from schools conducting intramural programs and from those not having intramural programs are indicated below according to groups.

	Returned	No program	Per cent not having program
Group 1	41	6	14.8
Group 2	101	8	7.92
Group 3	96	5	5.21
Group 4	68	1	1.18
Group 5	36	3	8.76
All Schools	342	23	6.73

If the schools selected provided a typical sampling, the above shows that the large and small schools are less apt to have intramural programs than those in the middle groups. However it needs to be said that some of the schools indicating a program showed evidence of conducting a very meagre one. Some schools listed but one sport (basket ball) while others listed the same sport for fall and winter.

The various questions and the condensed responses are indicated as follows:

1. *Units for Competition:* The various units (with duplications) are listed in order of frequency for all schools—interclass (169), home room (136), specially organized groups (90), gymnasium class (25), a classification index (25), extra curricular groups (18), academic classes (6), neighborhood groups (2). Only in group five was there any variation in popularity when the home room was listed as slightly more in use than interclass. The more comprehensive the program, the more tendency

to include more than one type of unit for competition.

2. *Persons Designating Team Members:* The answers to this question were listed under five headings. The responses in order of frequency are as follows: Students alone made selection in 50 per cent of the schools. Under this heading were included all the answers which indicated that the students themselves made the selection either thru independent organization or by rotating choice of candidates by team captains. In 25 per cent of the schools the supervisor alone made the selection. Students and supervisor in 20 per cent of the schools. Supervisor and another faculty man—2 per cent, other methods 2 per cent. Answers kept about the same relationships in the first three groups but students choice was higher in groups four and five.

Several bits of information were volunteered in answer to this question. Opinions were expressed to the effect that the most democratic method of selecting team members is to elect captains and managers and allow these students to select team members. Others contended that particularly in the absence of definitely organized units of competition there is more assurance of all boys being selected on teams if the supervisor has some choice in the matter of selection. In this respect several schools apparently use the following method: All boys interested in a sport are asked to sign up. Captains and managers are chosen or elected. These captains select a given number of candidates for competition while the supervisor chooses a lesser number. The supervisor naturally selects those boys who would otherwise not be selected enthusiastically, thus keeping some balance in the relative abilities of the competing units.

3. *Conducted in Conjunction With or Independent of Required Physical Education:* Judging from the answer to this question there is a distinct tendency to conduct the intramural program independently of the required physical education classes. Two hundred and twenty-eight schools answered in the negative while 87 (27 per cent) replied in the affirmative. Four schools did not answer the question. While there is a pronounced trend not to conduct intramurals in conjunction with the required physical education program it is interesting to note the tabulations as to groups. In group one, 36 per cent of

the schools conducted the intramural program in conjunction with the required physical education. This was the case in but 18 per cent of the schools in group two; 33 per cent of those in group three; 31 per cent of those in group four and 25 per cent of those in group five.

4. *Serves as a Substitute for Required Physical Education:* Only 40 schools (13 per cent) of the 316 schools answering this question replied in the affirmative. Two hundred and seventy-four schools do not allow the intramural activities to serve as a substitute for the required physical education. Thirty-two per cent of the schools in group one followed this practice; 14 per cent in group two; 10 per cent in group three; 4 per cent in group four and .090 per cent in group five.

5. *Require a Specific Training Period:* Of the answers from 306 schools relative to this question, 135 (44 per cent) indicated that they required a specific training period, 167 (55 per cent) answered in the negative, while four mentioned that it depends upon the sport. Only in one group is the percentage of schools which requires a specific training period greater than those which do not—fifty-seven per cent of the schools in group one make this requirement. The remainder coincide rather favorably with the entire group.

6. *Offer Supervised Practice Periods:* Two hundred and twenty schools (72 per cent) of the 306 answering the question replied in the affirmative while 86 (28 per cent) answered that no such periods were offered. Eighty-four per cent of the schools in group four and 82 per cent in group one offered supervised practice periods while this was the case in 64 per cent of schools in group three; 75 per cent in group two and 71 per cent in group five.

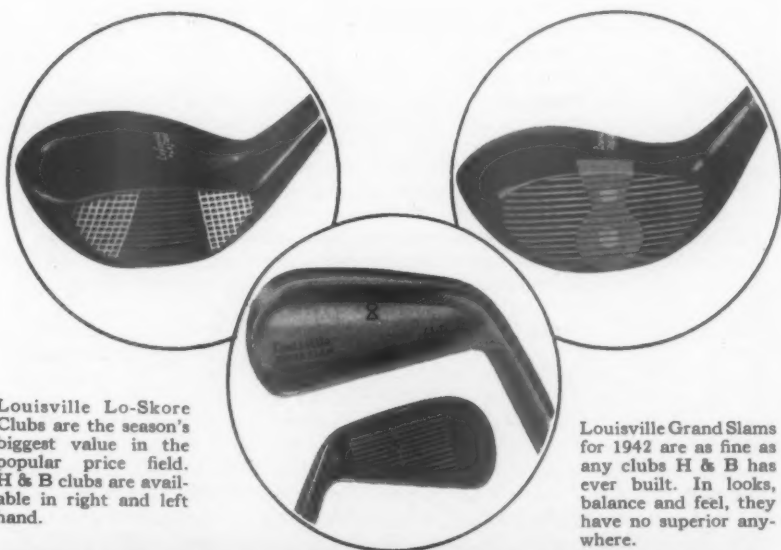
7. *Method of Financing Intramural Program:* The responses from 316 schools brought a great variety of answers to this question. These were classified under nine heads. Forty-eight per cent of the schools financed intramural programs from the physical education budget. The replies from schools in groups one, two and four held rather uniformly to the percentage of the entire group. Fifty-nine per cent of the schools in group three and 32 per cent of those in group five received the financial support in this manner. A disturbing factor is indicated in that 88 schools (27 per cent) replied that the in-

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tramural program was dependent upon athletic receipts for complete financial support for the intramural athletic program. This was the case in 31 per cent of the schools in groups one and four; 30 per cent in group two; 25 per cent in group three and 18 per cent in group five signified this method of finance. The remaining methods of financing intramurals for the entire group follows: combined physical education budget and athletic receipts (eight per cent), separate budget (six per cent) by student activity fund (five per cent), admission to intramural games (two per cent) entry fees (two per cent), contributions from civic clubs (one per cent), projects, plays and dinners (one per cent).

8. *Sports in the Intramural Program:* The questionnaires returned from the 319 schools included a total of 81 different sports—47 of these were mentioned three times or less. In this list were games ranging from checkers, chess and washers to a wide variety of more active games, many of which are dependent upon climatic conditions. The 34 sports mentioned more than three times are listed here in alphabetical order: Aerial darts, Archery, Badminton, Baseball, Basketball, Bowling, Box-hockey, Boxing, Cross-country, Fencing, Field hockey, Football, Golf, Gymnastics, Handball, Horseback riding, Horse-shoe, Ice Hockey, Paddle tennis, Rifle, Shuffleboard, Six man football, Soccer, Softball, Speedball, Swimming, Table tennis, Tennis, Tetherball, Touchfootball, Track, Tumbling, Volleyball and Wrestling.

Schools varied in numbers of sports from one to 29. Several schools listed a single sport (basketball) which was conducted fall, winter and spring. In group one the average number of sports listed was 2.5 per school although five schools listed but one sport in the program. In group two the average sports per school was 3.5. Four schools list one sport (basketball) and twelve schools list but two sports. Schools in group three averaged 3.4 sports per school although three schools listed only one sport and eight schools mentioned but two sports in the program. Group four schools averaged three sports per school. Two schools from this group listed but one sport and one school but two sports. The average of sports in group five was 3.8 per school. It is to be noted that although many schools are listed as having intramural programs in many instances they are limited in scope. On the other hand some schools show evidence of very comprehensive programs. The extent of

the program is governed largely by time, equipment and the ability to furnish supervision.

9. *Popularity of Sports According to Groups:* Sports were assigned weightings for tabulation. High numerical totals were used as a means of determining their popularity. Basketball was far in the lead in popularity in all groups. Softball was second in all groups but tied with touch football for that position in group five. Of the 319 schools the aggregate popularity of the first 15 sports in order was as follows: (1) Basketball, (2) Softball, (3) Touchfootball, (4) and (5) Track and Baseball, (6) Football, (7) Volleyball, (8) Tennis, (9) Table Tennis, (10) Badminton, (11) Swimming, (12) Soccer, (13) Golf, (14) Wrestling, (15) Bowling.

10. *The Employment of a Definite Point System:* While there was no reply from fifteen schools in regard to this question, there is apparently no great trend in this direction. Two hundred and ten schools (61 per cent) employ no definite point system for the intramural program. The idea is used in 94 schools (39 per cent). The greatest trend toward a definite point system was found in group five with 45 per cent.

11. *The Giving of Awards:* Replies relative to this question were received from 311 schools—one hundred fifty-five returns indicated that awards were given at the schools in question while 156 replied in the negative. The tendency to give awards was found to be the greatest in group five. Sixty-six per cent of the schools in this group present awards for intramural competition. The least tendency in this direction was found in group one in which only 38 per cent of the schools replied in the affirmative. Awards were given in 43 per cent of the schools in group two; 51 per cent in group three and 56 per cent in group four.

12. *Type of Award:* While many schools indicated the practice of giving several different kinds of awards, the one mentioned most frequently was the monogram (75 schools). Medals were second on the list mentioned 58 times; certificates third (29). Sweaters were awarded in eight schools. A large list of items such as ribbons, banners, etc. were mentioned but no definite trend was noticed in the direction of any single item.

13. *The Giving of Awards Considered as:* (a) Imperative (b) Important (c) Desirable (d) Not Necessary (e) Given but not considered important (f) Not given but considered important: Answers

to this question were received from 309 schools. Reviewing the returns from all of the schools it was found that only one per cent considered awards as imperative. Ten per cent of the schools considered that awards were important. Returns from 119 schools (40 per cent) indicated that the giving of awards for intramural competition was not considered. Nine per cent of the schools indicated that awards were given but were not considered necessary to the intramural program. Ten per cent of the schools not giving awards considered that the practice was desirable or important.

14. *Rules of Eligibility:* The replies to this question expressed a wide difference of opinion. These differences were not only shown in the questionnaire results but two individuals expressed concern that anyone should ask such a question. It was pointed out that generally only school membership is required of the student for participation in worthwhile activities sponsored by the school. Intramural athletics are considered educational by the very fact that they are sponsored by the school. This being the case, why deprive the boy of the educational benefits merely because he does not conform to a battery of rules most of which are laid down with the idea of making him do something that as adults we consider necessary. That these views do not have universal support is shown in the fact that while the returns indicate a distinct trend toward the simplification of eligibility rules, there are some schools that require the same rules for intramural competition that are in force for interscholastic competition.

For the sake of convenience in tabulation, the rules of eligibility are grouped. The capitalized headings are those which are used in the discussion later. Following each heading are the items which were tabulated under this head. (1) None—in which the response to the question was simply "none". This response implies school membership, however these items are carried separately. (2) School Membership—Everyone participates—School enrollment—Definite amount of attendance at school—Regular attendance at school. (3) Scholastic Attainment—Passing in work—Passing in a definite number of hours or units—Carrying a definite number of hours or units. (4) No Interscholastic Squad Membership—No letterman allowed to compete in sport in which he earned a letter—No man in intramurals who has had varsity experience—No men
(Continued on page 30)

Popularity of Sports by Groups

Group I	Group II	Group III	Group IV	Group V
Basketball	Basketball	Basketball	Basketball	Basketball
Softball	Softball	Softball	Softball	Softball and
Football	Touchfootball	Touchfootball	Touchfootball	Touchfootball
Track	Tennis	Table Tennis	Baseball	Football
Touchfootball	Track	Baseball	Football	Swimming



HOW TO BRING Sportslights UP · TO · PAR Now

Spring Checkup and Servicing Make Floodlights Last Longer

Fans expect fast games full of real entertainment when they attend night tilts under the lights. To assure their enjoyment, sports floodlights must operate at peak efficiency.

Accumulated dust, dirt and soot, coupled with damaged or faulty wiring and equipment, can reduce the efficiency of your lights more than 50%. A complete inspection and servicing of your system now not only assure greater efficiency at lower operating expense, but lengthen the life of your sportsfield lighting equipment.

A regular cleaning schedule and wiring inspection should be planned. Group replacement of lamps, including those which have passed their normal rated life, is recommended. By maintaining the operating voltage of the system at 10 per cent above the rated lamp voltage, light output can be increased approximately 35 per cent. Loss in light output can be determined by a series of light meter readings.

Your nearest Westinghouse Lighting Specialist will be glad to help you with your maintenance problems. Or, you may write Westinghouse Electric & Manufacturing Co., Edgewater Park, Cleveland, Ohio.

HERE'S WHAT TO LOOK FOR

1. Blackened and Over-age Lamps that Waste Current and Lower the Light Output.
2. Worn or Frayed Wiring that Can Cause Circuit Failures.
3. Poor Connections and Faulty Circuit Safety Devices.
4. Loose Mounting Bolts that Hold Units Insecurely.
5. Improperly Focused Units that Waste Light and Cause Annoying Glare.
6. Dirty Reflectors, Lenses, and Lamps . . . Which May be Cleaned Easily with Non-abrasive Soap.



Westinghouse *Lighting Equipment*

Their Best Foot Forward

By Richard Lane Bernstein
Los Angeles City College

WHAT is it, that a track man possesses, that makes him run faster, jump farther and have more endurance than the average college boy? This was Coach Harry W. Campbell's pet problem. Each year, he methodically went about conditioning Los Angeles City College tracksters, until two years ago, he decided a survey would be an easy way to solve it. The survey, conducted under the N.Y.A., was supervised by student Al Perez. Working under Perez, a selected group of workers surveyed City College's top-flight track and cross-country teams, compared them with themselves, as well as with non-athletes from regular gymnasium classes.

Each man was classified according to his event, in an effort to determine the physical structure of various types of track men. Negro athletes were measured separately in an effort to discover the reason for their apparent superiority in track events.

When the results of the survey were compiled statistics showed that distance runners are considerably lighter than non-athletes or other track men. The distance man's weight average was 141 pounds, as compared to 150 pounds for men in general gymnasium classes. Milers and two milers averaged 2.05 pounds per inch of height as compared with 2.19 pounds for other track men and 2.16 for non-athletes.

Distance men should, and do, carry less weight per inch in height. This enables them to run longer without becoming fatigued. A six-foot runner, who tips the scales at 150 pounds, has a great advantage over a 190-pounder of the same height, since the heavier man's legs have more weight to support.

The blood supply of the weightier man has a larger area to cover in removing wastes (lactic acid) that accumulate as a result of strenuous exercise. This allows the symptoms of fatigue to appear in him sooner than the lighter person.

It was further disclosed by the figures in the survey, that the track man's leg length, in comparison with the rest of his body, is much longer than the non-ath-

lete's. High-jumpers had the longest legs while distance runners were second. The average leg total of the high-jumpers was 47.1 per cent, while sprinters measured 47 per cent and non-athletes tallied 46.8 per cent. The leg length was in relation to the rest of their bodies.

A tall, high jumper has a longer kick, which aids him in gaining height. The distance man has less weight in his torso and concentrates most of his weight on his legs. The longer a runner's legs, the longer his natural stride and the less effort necessary to run. The long-legged athlete usually has more leverage and a better body lean. A good dash man, the survey disclosed, should have a stride of between six and seven feet in length.

One of the most surprising discoveries, unearthed by the survey's results, was that a track man's feet are larger than a non-competitor's. The track man's foot averaged 10.6 inches, while the average student's was only 10.4. The long-distance runner had a foot length of 10.7, the jumpers 10.6, the sprinters 10.5, and the negro athletes the largest with 10.8.

This fact was later explained by the computation of the heel-to-ankle measurements. It was this measurement, which sustained Coach Campbell's theory, that it is the distance between the heel and the ankle, not the length of the tendon of Achilles that determines a man's spring. It was also found, upon examining some tracksters, that the cord could be developed, but the ankle measurement must be natural.

In computing the heel-to-ankle measurement among the different types of track men, evidence was found that athletes, who needed spring in their events, had a large heel-to-ankle measurement. The distance men boasted a medium of 2.56

inches, the jumpers 2.68, the sprinters 2.67, while the negro had the highest with 2.75.

These figures show that it is probably this physical asset, that makes the negro a superior track man. Sam Lankford, former City College sprinter and city preparatory school champion who ran the 100-yard dash in 9.6, had a 3-inch measurement.

Dick Fordham, City College record-holder, who broad-jumped 23 feet, 9 inches, had a measurement of 2 and $\frac{3}{4}$ inches while rangy Tom Dow, who jumped consistently over 6 feet, measured 3 inches, as did Tom Flack, sensational field man who specialized in the javelin.

The following explanation in the terms of physics and mathematics should emphasize the importance of the heel-to-ankle measurement. When a man jumps or runs, he drives off the ball of the foot and toes. This section of the foot may be called the fulcrum of the foot lever. His weight is hinged at the ankle bone of point W as shown in Diagram 1. B is therefore the distance from the toes to the ankle bone and b is the distance from the ankle bone to the end of the heel, where the tendon of Achilles is fastened. This great tendon in turn is fastened to the large muscles of the calf of the leg, which, when contracted lifts the body weight at W.

To illustrate: W is the weight of the athlete in question and B is the length of his foot from the toe to the ankle bone; b is the length of the foot from the ankle bone to the tendon of Achilles and F is the force, that he can exert through contracting his calf muscles. It follows that:

$$W \times B = F (B + b); F = W \frac{B}{B + b}$$

Further let us assume that the same athlete weighs 150 pounds. The length of his foot over all is 10 inches with B being 7 inches and b, 3 inches.

$$F = 150 \times \frac{7}{7+3} = 105 \text{ (Force used to lift the weight of the body)}$$

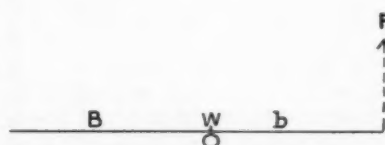
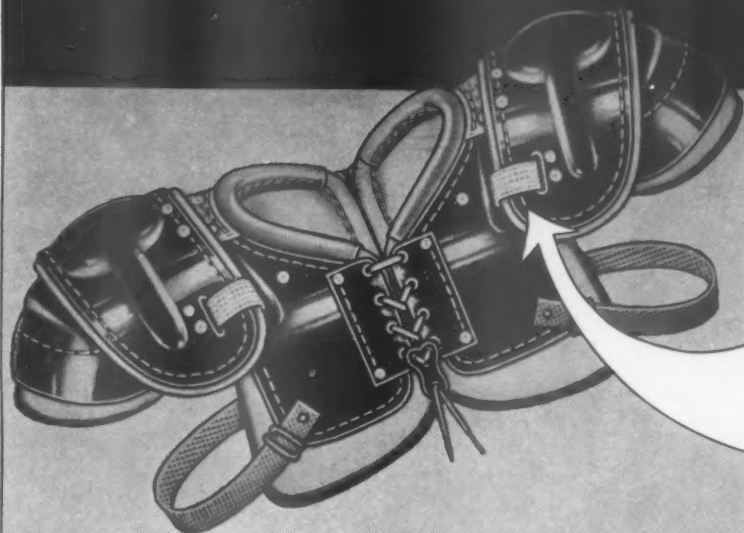


Diagram 1.

(Continued on page 31)

	Non-Athlete	Track Men	Jumpers	Sprinters	Runners	Colored
Average height	70"	70"	72"	70"	69"	71.6"
Average weight	152 lbs.	150 lbs.	152 lbs.	153 lbs.	141 lbs.	154 lbs.
Average lbs. per inch of height	2.09	2.19	2.12	2.16	2.05	2.14
Average knee-to-heel length	19.6"	20"	19.6"	20"	20"	20"
Average knee-to-crotch inches	13.9"	14.4"	14.3"	14"	13.75"	14.1"
Average total leg length	33.5"	33.6"	34.5"	34.5"	33.75"	33.8"
Average relation of leg length to total height of body	46.8%	48.2%	47.1%	48%	47.25%	47.3%
Average foot length	10.4"	10.6"	10.6"	10.5"	10.7"	10.8"
Average heel-to-ankle length	2.4"	2.6"	2.68"	2.67"	2.56"	2.75"

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(PATENTS PENDING)

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Keeps Flaps in position over the vital area between body fibres and shoulder caps.

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Breaks force of downward blow and spreads the shock over the entire chest and shoulder area.

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Insures longer life of pad by preventing flaps from being knocked or torn loose.

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Most outstanding development in shoulder pads in a decade.



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RAWLINGS MANUFACTURING CO.
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HIT PAYS TO PLAY



ON THE historic walls of the entrance hall of the Cadet Gymnasium at West Point these brilliant words are etched where all West Pointers can see them—"On the fields of friendly strife are sown the seeds which, in other years on other fields will bear the fruits of victory."

This quotation was inscribed while athletic-minded General Douglas MacArthur, today's number one American Soldier, was Superintendent at West Point, and is generally credited to him. It could have been conceived only by an *American* who believed in athletics and who recognized the importance of the American way of *sports* to the American way of *life—and of WAR*.

On gridirons, baseball diamonds, cinder tracks, tennis and basketball courts, and many other "fields of friendly

strife," on the speed to-win" finest po

Witho not be a defeat t

For many Co. to p advanced and other

What' "If it can

AN AMERICAN'S CREED

"I will follow the principles of good health, good sportsmanship, respect discipline, keep clean of mind and use my time well for the improvement of my character, morale and relationship toward my fellow men for the defense of our country."



**"ON THE FIELDS OF FRIENDLY STRIFE
ARE SOWN THE SEEDS WHICH
IN OTHER YEARS ON OTHER FIELDS
WILL BEAR THE FRUITS OF VICTORY"**

*Credited to GENERAL DOUGLAS MACARTHUR
while Superintendent at U. S. Military Academy*

It's Wilson today

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strife," our American boys develop the strength and stamina, the speed, the coordination, the fighting spirit and the "will-to-win" that make them great athletes and the world's finest potential soldiers, sailors and airmen.

Without our vigorous competitive sports, America *would* not be and *could* not be the *fighting* America it *must* be to defeat the hate-infected legions of Democracy's enemies.

★ ★ ★

For many years it has been the privilege of Wilson Sporting Goods Co. to provide for America's athletes and sports-lovers, the most advanced types of playing equipment. Leading stars of tennis, golf and other sports have used Wilson equipment exclusively for years.

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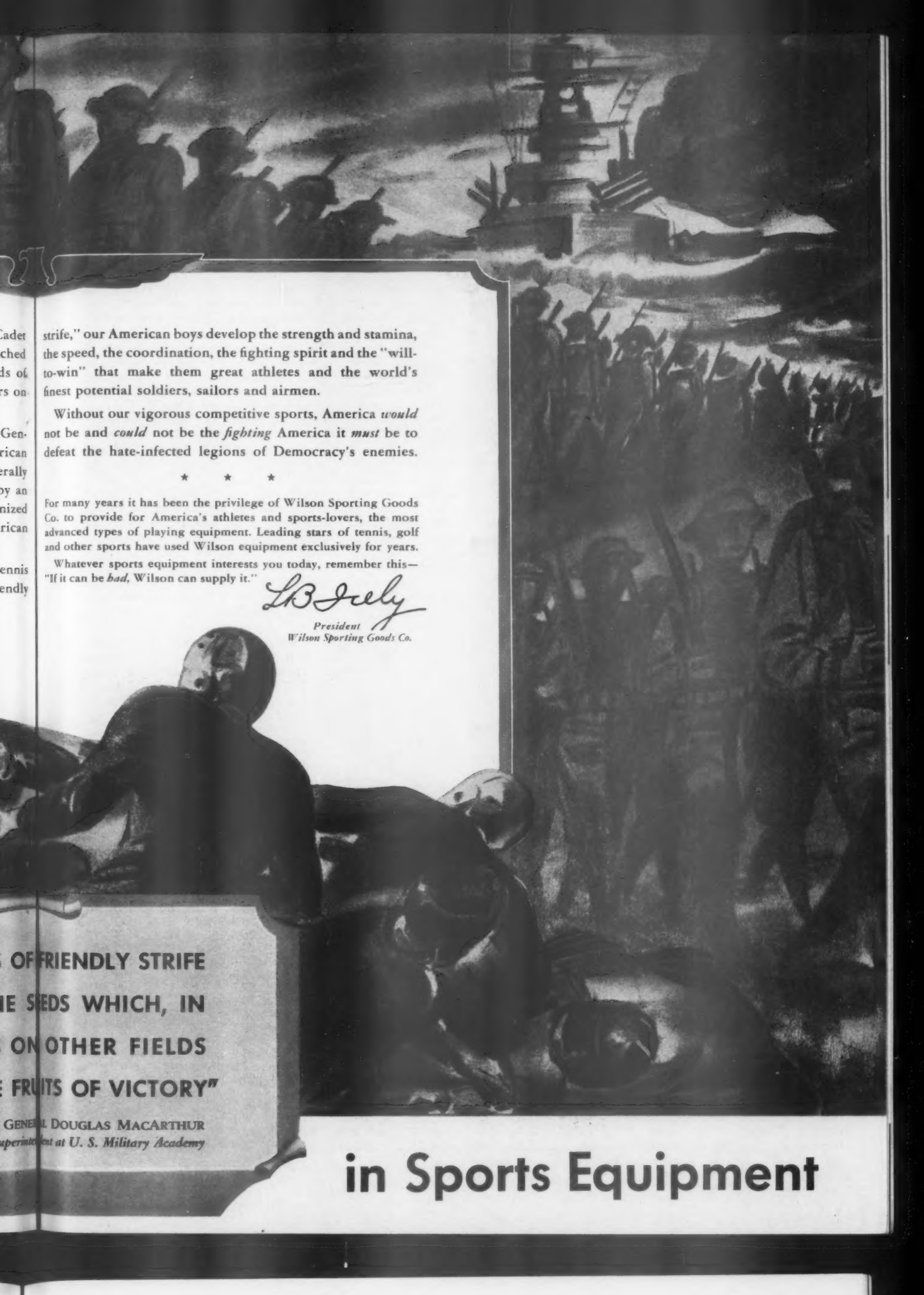
L.B. Jely

President
Wilson Sporting Goods Co.

OF FRIENDLY STRIFE
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ON OTHER FIELDS
E FRUITS OF VICTORY"

GENERAL DOUGLAS MACARTHUR
Superintendent at U. S. Military Academy

in Sports Equipment



The Individual Track Meet and the Comparable Scoring Card

By James R. Cretcher

Track Coach, High School, Clayton, Missouri

HOW often the track coach hears something like this on his track squad. "I'll challenge you to a track meet in the shot, pole vault, 100, 220, 880 and the broad jump." Challenges should be encouraged by the coach. A challenge of this kind on my squad was readily accepted and the meet was held. The challenger in this case won the 100, 220 and the broad jump; the challenged won the shot, pole vault and the 880. Three events were won by each contestant and so no decision, but the challenger should have won, for he was extremely close in the events he lost and he won his events with considerable ease.

An accurate comparable scoring system was needed. A simple, quick, accurate check on a comparable scoring card would have settled the problem for that particular meet.

I encourage a great many of these individual track meets. They develop well-

rounded teams. They pep up practice. They encourage boys to try other events and in this way the coach often discovers latent talent. A few illustrations may serve.

Tommy was a sophomore, tall, slender and willowy. He came out for track with an ambition to become a high jumper. Soon he could do 5 feet, 6 inches and 5 feet, 7 inches consistently which is fairly good height in our district for a sophomore. Tommy looked as if he might make a hurdler, but he did not want to hurdle; he wanted to concentrate on the high jump. I talked the problem over with my star low hurdler, a boy at that time a claimant for the national interscholastic record. We framed Tommy! Bud challenged Tommy to an individual track meet in the broad jump, high jump, 200 low hurdles and the discus. Tommy was secretly pleased to be singled out by one of the team stars. He accepted. Bud

was very poor in the discus; Tommy was worse. Bud won the broad jump by considerable margin. Tommy won the high jump at 5 feet, 7 inches, Bud having a bad day in this event which was part of the plot. Then came the low hurdles. I don't remember what Bud's winning time was but Tommy ran them in 24.7 seconds. What a revelation for Tommy! His time in the low hurdles was comparably better than his high jumping. In this way, we found a new hurdler to carry on Clayton's fine tradition of superior hurdlers. In Tommy's senior year in twelve meets, varying from dual to state, he was never beaten. He ran the low hurdles around two turns in 23 seconds when the accepted record established on a straight-away was 22.7 seconds. Much of this is beside the point. The point I wish to make is this: That April night I was mighty glad that I had an adequate comparable scoring card.

Points	P. V.	H. J.	B. J.	100 yd.	220 yd.	440 yd.	880 yd.	Mile	120 H.H.	200 L.H.	Shot- Put	Dis.
1000	13' 9"	6' 7"	25'	9.4	20.7	48.2	1:54.4	4:21.3	14	22.1	58' 10"	174' 3"
960	13' 6"	6' 6"	24' 7"	9.5	20.9	48.7	1:55.5	4:24	14.2	22.3	57' 9"	170' 9"
925	13' 3"	6' 5"	24' 2"	9.6	21.1	49.2	1:57	4:27	14.3	22.6	56' 8"	167' 2"
890	13'	6' 4"	23' 10"	9.7	21.3	49.7	1:58	4:29.5	14.4	22.8	55' 7"	163' 11"
855	12' 9"	6' 3"	23' 5"	9.8	21.5	50.2	1:59	4:32.5	14.6	23	54' 8"	160' 7"
820	12' 6"	6' 2"	23' 1"	9.9	21.7	50.8	2:00.5	4:35.5	14.7	23.3	53' 8"	157' 3"
785	12' 3"	6' 1"	22' 9"	10	21.9	51.3	2:01.5	4:38	14.9	23.5	52' 9"	154' 9"
755	12'	6'	22' 4"	10.1	22.1	51.8	2:03	4:41	15	23.7	51' 9"	150' 11"
725	11' 10"	5' 11"	22'	10.2	22.3	52.3	2:04	4:43.5	15.2	24	50' 10"	147' 11"
690	11' 8"	5' 10"	21' 8"	10.3	22.5	52.8	2:05.5	4:46.5	15.3	24.2	50'	145' 3"
660	11' 5"	5' 9"	21' 4"	10.4	22.7	53.3	2:06.5	4:50	15.5	24.5	49' 1"	142' 3"
630	11' 3"	5' 8"	21'	10.5	22.9	53.8	2:08	4:52	15.6	24.7	48' 2"	139' 1"
605	11'	5' 7"	20' 8"	10.6	23.1	54.3	2:09	4:54.5	15.8	24.9	47' 4"	136' 5"
580	10' 10"	5' 6 1/2"	20' 4"	10.7	23.3	54.9	2:10	4:57.5	15.9	25.2	46' 6"	133' 8"
555	10' 8"	5' 6"	20'	10.8	23.5	55.4	2:11.5	5:00.5	16.1	25.4	45' 8"	130' 11"
530	10' 6"	5' 5"	19' 8"	10.9	23.7	55.9	2:12.5	5:03	16.2	25.6	44' 9"	128' 2"
505	10' 3"	5' 4"	19' 5"	11	23.9	56.4	2:14	5:06	16.4	25.9	43' 11"	125' 4"
485	10'	5' 3"	19' 1"	11.1	24.1	56.9	2:15	5:08.5	16.5	26.1	43' 3"	123'
465	9' 10"	5' 2"	18' 10"	11.2	24.3	57.4	2:16.5	5:11.5	16.7	26.3	42' 6"	120' 8"
445	9' 8"	5' 1 1/2"	18' 6"	11.3	24.5	57.9	2:17.5	5:14	16.8	26.6	41' 8"	117' 9"
425	9' 6"	5' 1"	18' 3"	11.4	24.7	58.4	2:18.5	5:17	17	26.8	40' 11"	115' 7"
405	9' 4"	5'	17' 11"	11.5	24.9	59	2:20	5:19.5	17.1	27	40' 2"	112' 10"
385	9' 2"	4' 11 1/2"	17' 8"	11.6	25.1	59.5	2:21	5:22.5	17.3	27.3	39' 5"	110' 6"
365	9'	4' 11"	17' 4"	11.7	25.3	60	2:22.5	5:25.5	17.4	27.5	38' 8"	108'
345	8' 10"	4' 10"	17' 1"	11.8	25.5	60.5	2:23.5	5:28	17.6	27.7	38' 1"	106' 1"
325	8' 8"	4' 9"	16' 10"	11.9	25.7	61	2:25	5:31	17.7	28	37' 4"	103' 7"
305	8' 6"	4' 8 1/2"	16' 7"	12	25.9	61.5	2:26	5:33.5	17.9	28.2	36' 9"	101' 8"
290	8' 4"	4' 8"	16' 4"	12.1	26.1	62	2:27.5	5:36.5	18	28.4	35' 11"	99' 1"
275	8' 2"	4' 7"	16' 1"	12.2	26.3	62.5	2:28.5	5:39	18.2	28.7	35' 4"	97' 1"
260	8'	4' 6 1/2"	15' 10"	12.3	26.5	63.1	2:29.5	5:42	18.3	28.9	34' 9"	95' 1"
245	7' 10"	4' 6"	15' 7"	12.4	26.7	63.6	2:31	5:45	18.5	29.2	34' 1"	93' 1"
230	7' 8"	4' 5"	15' 4"	12.5	26.9	64.1	2:32	5:47.5	18.6	29.4	33' 6"	91'
215	7' 6"	4' 4 1/2"	15' 2"	12.6	27.1	64.6	2:33.5	5:50.5	18.8	29.6	32' 10"	89' 3"
200	7' 4"	4' 4"	15'	12.7	27.3	65.1	2:34.5	5:53	18.9	29.9	32' 3"	86' 10"
185	7' 3"	4' 3 1/2"	14' 10"	12.8	27.5	65.6	2:36	5:56	19.1	30.1	31' 7"	84' 8"
170	7' 1"	4' 3"	14' 8"	12.9	27.7	66.1	2:37	5:58.5	19.2	30.3	30' 11"	82' 7"
155	7'	4' 2"	14' 6"	13	27.9	66.6	2:38	6:01.5	19.4	30.6	30' 6"	81' 2"

Name
School
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100
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880
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INDIVIDUAL SCORE CARD

Name	Time	Points
School	Distance	Height
Number		
Event		
100		
220		
440		
880		
Mile		
120 H.H.		
200 L.H.		
Shot		
Discus		
P. V.		
H. J.		
B. J.		
Total Score		

Instructions: (1) Circle, or write in, competitor's time (distance, or height). (2) Refer to points allowed for that performance. (3) Transfer both time (distance, or height) and point allowance to above table. (4) Total Score (high man wins).

Note—If total score is close or greater accuracy is desired, interpolate, or refer to MASTER SHEET for fractional time (distance, or height) not listed.

Another example! The same Bud had a younger brother. He had grown up in the family and had listened to the praise and adulation bestowed upon Big Bud. In his heart Little Bud wanted to become as great a star as had his brother. Little Bud was built on the same generous proportions as his older brother, but was timid, self-conscious, shy, and, in general, lacking in self confidence. His sophomore year, he made the team but "didn't set the world on fire." During the winter preceding his junior year he constantly talked of not going out for track, feeling he was a failure and could never attain the goal set by his older brother. Then came the revelation. By plotting on the comparable scoring card the marks made by Big Bud as a sophomore, it was found that Little Bud had been able to do some things better than Big Bud had at the sophomore educational level. The lesson? Keep a chart of each boy's efforts. One fine stimulant is for a youngster to find that he is able to do something better than a former "great" or "star" did at the same period of development. Did Little Bud quit? He did not! I have another Bud this year.

There are several advantages to the comparable score card which I have developed: 1. It is based on high school performances. 2. It is based on high school events, discus, shot, hurdles. 3. It is in the English measuring system instead of the metric. 4. It is up-to-date.

The accompanying chart is the one I



Sid Luckman of the Chicago Bears. High-speed photo taken at Spalding Research Laboratories. ©A. G. Spalding & Bros., Division of Spalding Sales Corp.

92 YARDS AGAINST THE WIND*

● That's just one of the countless kicking records made with Spalding's famous J 5-V Foot Ball. Watch your kickers nick the coffin corner — and your passers hit their targets!

J 5-V has perfect balance, greater shape retention — withstands 5 times more inflation pressure than an ordinary ball. Selected cowhide tanned by exclusive Spalding process — plus special triple inner-lining. Used by practically every leading college team, coast to coast. Each \$12.50. Trade price \$9.45. There are other Spalding Foot Balls priced for every budget.

*1940 S.M.U. VS. PITT.



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DESIGNERS and BUILDERS
of

ASPHALT TENNIS COURTS

IN NATURAL AND COLOR FINISH

SORE MUSCLES put you "on the shelf"?



PROMPT RELIEF!
Help nature drive
out *Fatigue Acids*

THOSE SORE, STIFF MUSCLES that so often follow your first real exercise in spring, usually come from an accumulation of waste products called *fatigue acids*.

So, to relieve the pain, get at the cause. Help Nature. Just splash those aching muscles with Absorbine Jr. full strength. Many of them can be reached by its fast, stimulating action. It speeds the blood flow through the muscles to carry those fatigue acids away. This helps reduce swelling—ease pain and stiffness. Your muscles can r-e-l-a-x! Keep Absorbine Jr. handy. At all druggists, \$1.25 a bottle.



FREE—Order your copy of these drawings today. This muscle chart (shown above—size 22" x 16") will be sent free upon request, together with a free sample of Absorbine Jr. Write W. F. Young, Inc., 245-B Lyman Street, Springfield, Mass.

FAMOUS also
for relieving
Athlete's Foot,
Sprains, Bruises

ABSORBINE JR.

use. It is based on performances made in 1941. Several hundred copies may be mimeographed in the school office. We use a heavy paper stock or lightweight cardboard, 8½ by 11 inches. On one side we have mimeographed the individual score card which appears on page 27. On this page there is also space for the

"Points" column and the first three columns of records. On the reverse side are the remaining columns of records.

I have found the individual track meet and comparable scorecards valuable in pepping up practices and in discovering latent talent. I am certain that I have discovered good track athletes in this way.

The Portland Interscholastic Insurance Plan

By Eldon I. Jenne

Director of Health, Physical Education and Recreation
Portland, Oregon, Public Schools

(Continued from March issue)

BLANK USED IN FILING REPORT OF INJURY

POSITION ON FIELD WHERE
INJURY OCCURRED.

.....End Zone
.....Goal Line
.....20-Yard Line
.....Between 20-Yard Lines
.....Safety Zone
.....Space Beyond Sidelines

TIME OF INJURY

How long had the boy been playing when injury occurred? Indicate by check the time of injury.

Min-ute	1st Qtr.	2nd Qtr.	3rd Qtr.	4th Qtr.
1
2
3
4
5
6
7
8
9
10
11
12

In case of game, scrimmage, or practice session of irregular periods of time, kindly state number of minutes boy had played up to the time of the injury.
..... Minutes.

TYPE OF PLAY

Kindly check the type of play in which the injury occurred.

.....Kick Off
.....Forward Pass
.....Lateral Pass
.....Punt
.....End Run
.....Attempt at Field Goal
.....Line Plays

BOY ACTIVITY

Check activity at time of injury.

.....Blocking
.....Blocked
.....Tackling
.....Tackled

.....Forward Passing
.....Receiving Forward Pass
.....Lateral Passing
.....Receiving Lateral Pass
.....Kicking
.....Receiving Kick
.....Returning Kick

Other Activity

What, in your opinion, caused this injury?

I hereby affirm that the foregoing is the complete information available on the above case.

(Coach

(High School)

Summary:

1. Through co-operation between School District Number One, the Multnomah County Medical Society, and the Portland District Dental Society, a plan for centralized control of athletics was set up under the supervision of the Department of Health, Physical Education, and Recreation.

2. The phase presented above concerns itself with the medical and dental care of the high school athletes, under which the following were accomplished:

1. All students desiring to participate in athletics were given a preseasonal examination and all had to meet certain physical requirements.
2. An insurance plan was instituted which allowed free choice of physician or dentist.
3. First aid care was provided during football games.
4. Records of injuries were kept and reviewed to ascertain the reasons for injuries. Recommendations were made and followed with a resultant drop in the number of injuries.
5. Athletic injuries were cut 37 per cent in football during the 1940 season.

6. No major type of injury occurred in 1940.
7. One of the smaller schools with a limited number of available players began to show a marked increase in injuries during the first half of the 1940 season. The School Health Committee and Mr. Bradley examined the general condition of the entire squad and found them to be safe from over-training. The Committee recommended and the coach co-operated in shortening the practice hours and eliminating all scrimmage. The result was a noticeable lessening of injuries and an improved team morale and team play.
8. General satisfaction was evidenced by the athletes, their families, the School District, the coaches and the physicians and dentists.
9. The insurance carrier, Mr. M. F. Bradley cancelled the customary insurance charge the first year of operation and accepted only out-of-pocket expense in order to get this program started. His personal follow-up of the injuries, which amounted to actually calling on the families and seeing the injured athlete personally, did much to carry the program over the shoal water the first year.

Developing the Student Assistant

By Paul Taliaferro
Bowie, Texas, High School

EVERY high school athletic coach has need for a helpful student assistant; and where squads are large and a coach has more than one sport, he often needs more than one helper.

There are a number of necessary techniques that an intelligent boy can develop under a sympathetic and capable coach. Most large schools have a build-up system for student helpers and have an experienced senior for one of the helpers each season. A junior and a sophomore work under the senior and move up with grade promotion. This is a very desirable plan in schools where coaches serve long tenures and can plan ahead. In the smaller high school the selecting of a student helper is a more difficult task, and the coach should be careful in choosing his student assistant. The boy chosen should have a congenial personality and be a favorite boy with the athletic group with which he will work. It is not necessary that he be an athlete, but he should be interested in the sport. The helper should be healthy, alert, friendly, and neat in appearance. He should be tactful and understand that he is not a coach. In making a choice the coach should select an honest and dependable boy, since he is trusted daily with



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responsibilities which require the best.

The student helper should have above-average ability for a number of reasons. He will need extra time for some of his duties and should be able to use this time without injury to his scholastic grades. Many of his duties require intelligence and dependability. An intelligent coach assistant with basic instructions can be responsible for team reports, journalism reports, and practice and game statistics. When coaches have two team assistants, they should divide the duties according to

the ability of each and the time available for work.

No student should be used who does not have patience and emotional stability. His duties are so many that to be worth while he must be diligent. The coach should teach him first-aid techniques for minor injuries. This should not suggest that a coach should be careless with minor injuries; however, under his guidance a helper can save him much time. In a small school the coach is often held responsible for concessions, and here the

student assistant can be of valuable help. The duties of advertising management are also given the small high school coach; again he can get valuable assistance from a well-trained helper. In fact, without a trained helper, he must neglect either his coaching duties or his other responsibilities.

To insure more time for coaching duties and at the same time to do the many tasks that befall a high school coach, he should be very careful in making his selection of a student helper.

Intramural Athletics for High School Boys

(Continued from page 20)

who are ineligible for varsity competition—No intramural competition for squad members when varsity and intramurals coincide—No man who has competed on first or second team in a given sport that year. (5) Physical Fitness—Physical examination before participation—Same training rules as for varsity. (6) Group Membership—Participants are on the team only in each sport—Member of student activity fund—Member of Club, Class or Home Room. (7) Miscellaneous—A definite age limit for competition—Same rules as for interscholastic competition—Same rules of competition as prescribed by the State High School Athletic Association—No post-graduate or ninth semester students eligible—Good standing in school—Paid up in athletic insurance—Parent's consent. (8) Good citizenship—Good sportmanship—To abide by the rules—Good character and willingness to cooperate. Returns were listed under the above headings regardless of duplications i.e. most schools require competitors to adhere to several rules. Thirty-eight schools indicated no eligibility rules. One hundred and thirteen mentioned school membership as the only prerequisite. Mentioned 115 times were statements relative to interscholastic squad membership. These are listed above and are apparently considered important in an attempt to legislate against the participation of the best athlete against the mediocre group and to prevent "over participation." It is interesting to note that items under the heading physical fitness were mentioned but 36 times while those included in the scholastic attainment classification were mentioned 47 times. Group membership is listed 58 times and good citizenship 38 times. Fifty-one answers were received relative to items in the miscellaneous classification.

While there is a distinct indication that rules of eligibility are designed largely for the individual school involved there seems to be a rather uniform agreement that perhaps variations of the following are all that are necessary.

1. School membership.

2. It would seem wise, even though not frequently stressed in the returns, to include some provision for physical fitness if not otherwise cared for in the school system.

3. No scholastic squad membership in the same or coinciding sports.

4. Group membership.

15. *Person Responsible for Administration of the Program:* Of the 314 schools responding 59 per cent allocate the administrative responsibility to the physical education teacher. The coach was listed with the responsibility for intramural administration in 17 per cent of the schools. It is reasonable to assume that in some schools the coach and physical education teacher were one and the same individual and not designated as such in the returns. Ten per cent of schools assigned the duties to both coach and physical education teacher. Eight per cent of schools delegated the responsibility to a specific teacher other than coach or physical education teacher. One school (group 5) employed a special intramural supervisor.

16. *Type of Help Furnished Supervisor:* While many duplications were found in the returns in response to this question, in 244 (57 per cent) schools of the 310 answering used volunteer student help at least to some degree in a supervisory capacity. Starting with group one these responses for each group indicating the use of volunteer student help were as follows: 52 per cent, 50 per cent, 58 per cent, 67 per cent. Thirty-two per cent of all schools listed faculty assistance. Nine per cent employed student help (including N.Y.A.). This was true in five per cent of the returns from schools in group one, 13 per cent in group two, seven per cent in groups three and five respectively and ten per cent in group four. Two per cent of the entire group provided no assistance for the supervisor.

17. *When Program is Conducted:* The responses to this question were perhaps more varied than for any other question. In them is perhaps reflected the type of school and amount of time and available space. The number of responses for the

total group are listed herewith in order of frequency: After school only (138); noon hour and after school (36); gym period and after school (35); after school and Saturday (29); noon hour, after school and gym period (15); noon hour only (13); gym period, after school and Saturday (12); gym period only (7); gym period and noon hour (6); noon hour, after school and Saturday (5); night only (1); Saturday only (1); noon hour and Saturday (1).

18. *Does the Intramural Program Have Adequate (a) Time (b) Finances (c) Supervisors (d) Equipment:* The responses in percentage for 31 returns appear in table form below. Aside from the responses on the questionnaires, several letters were written stressing the point that the two main stumbling blocks for the intramural program were inadequate time and an insufficient number of supervisors. The matter of space and time go almost hand in hand in that interscholastic teams use the facilities and often occupy the supervisors at times which would also be desirable for intramural contests.

Group	1	2	3	4	5	All schools
Adequate time	yes	47%	40%	39%	31%	46%
	no	53	60	61	69	54
Adequate finances	yes	52	51	54	44	55
	no	48	49	46	56	45
Adequate No. supervisors	yes	62	43	47	32	52
	no	38	57	53	68	48
Adequate equipment	yes	56	55	58	48	56
	no	44	45	42	52	44

While a brief glance at the above table perhaps leaves one with the impression that these items are well taken care of in the intramural program, a more complete study of the figures will show otherwise. Roughly, two-thirds of the schools have what they consider inadequate time for the program. Nearly 50 per cent are too greatly restricted financially. Nearly 60 per cent of the schools have an inadequate

number of supervisors and 44 per cent have insufficient equipment.

Their Best Foot Forward

(Continued from page 22)

If on the other hand, the athlete had a foot with 8 inches for B and two inches for b.

$$F = 150 \times \frac{8}{8+2} = 120 \text{ (Force used in order to lift the body)}$$

Thus it is obvious, that a man with a long heel has a definite mechanical advantage in driving his body, as in running or jumping, where the body must be lifted off the ground. With the statistics obtained through the survey, Coach Campbell hopes to take a college student, measure him and predict to some degree, as to whether he has possibilities as a track man. Of course, there are exceptions to this as there are in everything else. There have been great athletes whose form and physical construction were entirely the opposite of what they should have been. These men, however, were great despite these things and not because of them.

In another phase of the study, it was found that the ideal cross-country runner should have the following measurements: height—five feet, eight inches; weight—130 pounds; leg length—34 inches; foot—10¾ inches; heel-to-ankle—2¾ inches; chest capacity—290 c.c.; and chest size—36 inches.*

Not every man, however, meeting the standards is sure to be a successful athlete, but he will have a distinct advantage over the other boys who are not up to these standards. His chances, because of this, are much greater.

These are the statistics compiled in Coach Harry W. Campbell's survey (N.Y.A.) at City College over a period of two years (1940-1941). His 1940 track team won the National Junior Division title, while his 1940 and 1941 cross-country teams won the Metropolitan Conference and Southern Pacific A.A.U. crowns.

*This chest measurement is normal. The expansion is noted in the chest capacity, which is the amount of air that the runner's lungs can hold.

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The Advantages and Construction of Asphalt Surfaced Tennis Courts

THE playing areas for the game of tennis have through the years undergone a series of changes more noticeable than the areas used in any other sport. Several decades ago tennis was considered a game that was played on well-kept grass courts. However, the high maintenance cost of the turf as well as the discoloration of the balls made this playing area unsatisfactory for parks, playgrounds and school use. The next move was clay courts which have gained rapidly in popularity until today over three-quarters of our national tournaments are the clay-court variety. The principal objection to clay courts among the schools and colleges is the slow drying qualities of even a well-drained and graded court. A heavy rainstorm on the day of a scheduled intercollegiate match usually makes the courts unplayable for the balance of the day. This often results in a cancellation of the match due to the necessity of the visiting team returning home.

More recently many other types of court surfacing have been tried, all with varying degrees of success. Concrete courts are rapid-drying, require very little maintenance cost other than patching a few ice cracks which may develop over the winter. The principal objection is the hard playing surface and the cost of construction.

Asphalt tennis courts are at present becoming exceedingly popular for use in schools and colleges because many objections found in the other types of courts are practically negligible in the asphalt type court. There is no maintenance problem at all, as William A. Reid, Graduate Manager of Athletics at Colgate stated, "They require no attention other than to sweep off the dead leaves."

The courts are rapid-drying and can be played on almost immediately following the completion of the rain. Further, asphalt courts can be played on early in

the spring before the frost is out of the ground, as well as late into the fall. In Northern states this has as much as doubled the playing time for the courts during the school year. Phil Brain, tennis coach at Minnesota University states that their new asphalt tennis courts will permit outdoor tennis forty-five days earlier than formerly and about thirty-five days later in the fall.

Asphalt courts are more resilient than concrete and hence are easier on tennis balls, shoes and feet. This resilience may be increased with the addition of certain top dressings mixed into the asphalt.

Construction of Court

Preferably a court should lie north and south and at a slightly higher elevation than the land immediately surrounding it. If the court is to be situated in a valley, excessive draining precautions must be taken.

If it is necessary to lay tile drains, they should be four inches in diameter laid with a one-third inch to one-fourth inch fall to the foot. These should appear at intervals of ten to fifteen feet aslant of the court and leading into a side drain outside of, and parallel to, one side of the court. The top of the tile should be between four inches and a foot below the sub-grade of the court. The joints should be covered with tar paper and trenches should be tamped with cinders or gravel.

The sub-drainage should be provided by laying a pervious material such as gravel or its equivalent to a depth of six inches or more as necessary.

The surface grading may be provided in a number of ways. A longitudinal fall of six inches between the base lines is recommended as easiest to construct, least objectionable to the players, and most satisfactory, when more than one court is to be built. This grade should be carried

to the limits of the court, giving approximately nine and one-quarter inches over 120 feet.

The sub-base of the court must first be cleared and brought to correct grading throughout, before any foundation material is laid. A wooden header, usually two by six in size in the full thickness of the base court, and of the wearing surface course, should be set up to the correct grade all around the area to be surfaced. The header should be held in a firm position by sturdy wooden pegs driven into the ground at about six foot intervals.

If gravel forms the sub-grade of the court, up to three inches of crushed stone should be applied. Consolidation of stone should be effected with a five-ton roller and the grading should be checked with as much precision as is required for the highest class concrete road.

It would be well to explain what is meant by plant-mix asphalt. Plant-mix asphalt is a combination or blending of minerals such as sand, limestone, gravel, etc. These minerals are passed through a screen, and all particles are thinly coated with pure asphalt in a mixing plant. Plant-mix asphalt is often called black top or asphalt concrete.

Pure asphalt is liquefied with chemical solvents, and when exposed to the air the solvents evaporate, leaving a sticky mass that is rolled to form a solid mat.

There are two types of base construction used. The first of these is the so-called penetration method and is the cheaper. In this method the base material is sprayed with liquid asphalt and then rolled. Forms are then removed and the low spots filled so that a uniform level grade exists. In the other method plant-mix asphalt is used and applied in the manner of ready-mix concrete. The cost of this method is about 35 per cent higher than the cost of the penetration method.

The top surface is then applied, depend-

ing on the choice of the contractor. Plant-mix asphalt is put down, carefully leveled and graded and then rolled with a five-ton roller. Twenty-four to thirty-six hours after work is completed the lines are painted.

Some engineers recommend a light application of Portland cement applied with a soft hair push broom. This lightens the playing surface and makes the court ready for immediate play. If the cement is not applied, it is advisable to wait for several days until evaporation is complete as some solvents may cause discoloration to the tennis balls.

Cost of Asphalt Court

It is rather difficult to state a flat cost for construction of an asphalt court, due to the many conditions that may arise.

First, there is the cost and amount of mineral aggregates that go into the construction of the court. In some cases under favorable conditions, it may not be necessary to construct a drainage system with a result that a base of three or four inches and a wearing surface of one inch are all that is needed. On the other hand, a drainage system and a base applied in two applications up to six inches and a wearing surface of one inch would materially affect the cost, as the amount of pure asphalt is determined by the thickness of the base.

The length of the haul, together with local pit prices for mineral aggregates is a determining factor. The average seems to run around \$2.25 per ton job site. The price of asphalt depends upon the amount used as well as upon transportation costs from point of distribution to job site. The average seems to be about twenty-five cents a gallon job site.

The cost of labor varies so that it is impossible to estimate this item. Further, if a battery of courts is constructed, the unit cost is about 10 per cent less.

The average cost of construction of an asphalt court is about fifteen hundred dollars. This is exclusive of backstop and fences. The cost of an asphalt court does not run more than 20 per cent higher than that of a clay court. Over and against the 20 per cent increased cost we find that we have increased the playing time 54 per cent. The cost of a clay court per playing day for its first year in operation is around \$7.14. The cost of an asphalt court on the same basis is about \$5.51. There is also the factor that the maintenance cost is negligible on asphalt courts.

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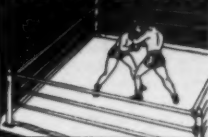
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ment in the following report on tennis popularity in his city: "Fort Dodge, Iowa's, interest and enthusiasm for tennis have reached a new high, made possible through the efforts of the Board of Education in that city, that has this year constructed five beautiful asphalt tennis courts, and surrounded them with a ten-foot steel wire fence. The plan is to add several more courts to those already in operation. The town used to be a leader in tennis circles, but, for the past few years, due to the lack of public tennis facilities and the closing of the Fort Dodge Tennis Club, that maintained four of its own courts, tennis had fallen to a very decided minus quantity. Last year upon less than a half dozen courts in the city it is estimated that no more than a couple of hundred played any tennis at all.

"This year the Board of Education turned its tennis courts over for use by the general public as well as for use of the students of the public school system. Under supervision a plan of hourly reservation was used.

This free democratic plan has been enthusiastically appreciated by the boys, girls, men and women of Fort Dodge. There has been an almost phenomenal rise in interest in tennis. There have been as many playing tennis in a single day upon the new courts as played upon the other courts in the entire city the whole last year. The courts have rendered an average service of more than two hundred tennis players a day.

"A city wide tournament has just been completed which attracted nearly a hundred entries to its nine divisions consisting of men's singles, women's singles, junior men's singles, boys' singles, girls' singles, men's doubles and mixed doubles. Entry fees were very small and were used to purchase small trophies, medals, and tennis balls for the tournament. Not only participants are finding tennis of interest but the spectators, hundreds of them, are finding entertainment in the game.

"Tennis in Fort Dodge is on the upgrade."

Safe, Inexpensive Hurdles

By Harry W. Burdick

Hillside School, Montclair, New Jersey

THIS brief article is written in the hope that it will aid instructors in the junior high schools. Many of us do not have the facilities for using the regulation hurdle. Furthermore, they are expensive, hard to handle and dangerous, especially for the beginner.

In the type of athletic program which we use, it is essential to have a large number of "squad" activities going at once. This means that a class of, say, forty-five, is divided into nine groups of five, thus spreading over the entire field. It is manifest that the director can not be at each squad at once—thus it is vital that the boys can place the apparatus correctly, can use it with a minimum of danger, and can carry it in after class with reasonable ease. The type of hurdle which I am about to describe was evolved because of these needs. If any program is interestingly motivated, the boys will be glad to help in any work which makes for betterment. Thus our hurdles were made, and have been kept in repair, by the boys themselves. They cost nothing, since they are made of "scrap wood."

Taking a piece of spruce plank 2x6, we nailed uprights of pine, approximately four inches wide and one inch thick. These uprights are twenty nine inches in height. Our bases are four feet wide, so that we have sufficient weight, and width to hold the hurdle firmly on the ground—yet it will tip over easily. Taking pieces of broken high-jump crossbars approximately one inch square, we cut them to fit the width and a little over. Just above the base we nailed a brace across the uprights, thus preventing side sway and breakage. Thus we have a hurdle which

will tip over if the toe catches—and the top will also come off at a touch. It will be seen that this sort of a hurdle will meet the objectives. One boy can carry a hurdle with ease. Another may carry all the crossbars needed. They cost only a little work, and there has not been a single accident since we have used them, which has been for more than fifteen years.

In order to assure correct spacing, we measure the distances between hurdles and drive a peg in the ground, exactly in line. Thus we have our five hurdles in line, one end against the peg, the start and finish also pegged and marked with lime. The "pegging" needs to be done only at the start of the season and the hurdles can, therefore be placed ready for work in five minutes.

It is quite remarkable to observe, the form and skill which has come as result of this type of hurdle, even the smallest boys showing no fear at approaching them, and, because of this, turning in some excellent performances. By getting the "mean average" for ages in six-month intervals, standards have been set toward which the boys may work, and so they know whether or not they are doing as well as they should for their age, regardless of whether or not they are in the seventh, eighth or ninth grade. By this scheme, the young boy has the opportunity to perform up to, or above, his own standard, even though he is in a class of older boys.

As a result, performance as a whole is kept to a high level, and, in meets with other schools, our boys have been extremely successful.

Notes from the Tenth Annual Track and Field Coaches Winter Convention

(Continued from page 16)

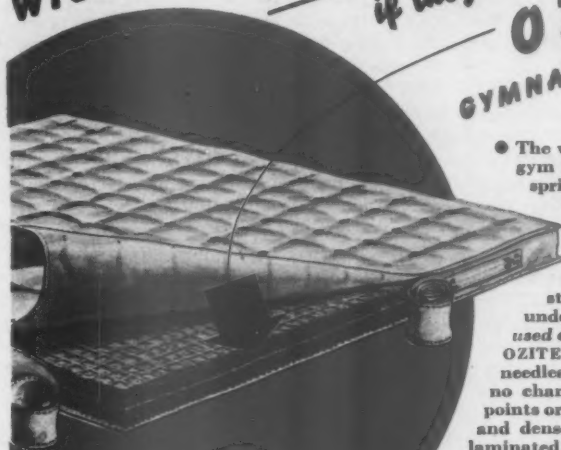
way and, to me, this is wasted effort. If a coach insists on boys using their arms when they get out of the holes instead of starting to put too much pressure on the push-off, he will find the boys will get under way much faster.

Many young boys have a habit of running with their arms almost straight down without any bend at the elbow at all. This is a big mistake. The boy's elbow should be bent above his hip, so that he can drive just as hard as he possibly can. A good way for him to get used to this method is to stand in front of his mirror before he goes to bed at night and practice driving with both arms, remembering to get well up on the balls of his feet. This soon becomes second nature to him.

Some boys have a very bad fault in making holes. They get up to the mark, and scratch a hole as a hen would do it. I insist on my boys making holes with a trowel, making the back of the hole deep and firm and the front of the hole shallowed out so that they will not catch it with their toes. To me this is the important feature of starting. I might add that I always have my boys measure the distance from the starting line to the back of their first hole, then to the back of their last hole. They can measure it with their shoes, and count up with the eyelets on their shoes.

After they have mastered their holes and start, the next feature, in my mind, is driving out of the hole and reaching as far as they can naturally. I know many coaches might disagree with me on this particular point. I have seen boys who have been coached to take a little dab, with the thought in mind that they get into the running more quickly. This, to me, is a fallacy. I often make a boy reach as far as he can, in fact, exaggerate, and then, finally get him down to the point where he can reach without any trouble whatsoever, and carry on. One thing is to have him do it his own way first and then have him reach as far as he can the next time. By experimenting with the two, you will invariably find the right distance for him to reach on his first stride. In other words, we have two types of runners. We have what is commonly called among the profession, the "top-of-the-ground" runner. This is a very light-footed fellow without too much power, but lots of speed. I might cite Jesse Owens of Ohio State as an example of this. It is not often that you can make a man of this type become a power runner.

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Take the opposite type, Ralph Metcalfe, of Marquette who drives and drives. That is the type I prefer.*

I am only sorry that I cannot demonstrate some of these ideas in person. It has been hard for me to put them down into notes, because I like to *show* my listeners how to do things rather than *tell* them. If there are any of the coaches who have not assimilated these things properly, and feel that they would like a little more knowledge on the subject, I would be glad to help them at anytime. I might say in closing that, when you get a boy reaching his natural stride, you will find him doing the same all along over a hundred yards. In fact, he will be reaching and reaching and reaching, until he achieves his goal.

One closing point. Have the boys keep their heads well over. I have stood alongside a track when I have had a boy whom I wanted to do this, and have had eight, nine, or ten students standing in line; and as the fellow went by, I have had them yell "drive, drive, drive." After the fellow has heard it enough, he takes to it naturally, and you feel then that you have accomplished something.

Something About Long-Distance Runners

By Emil von Elling

Track Coach, New York University

IN the immediate past, you will doubtless recollect, there was much loose talk about working the boys too hard, burning them out in competition. How often we have heard of the great danger of a young man running several races in a single set of games. Such criticism emanated from those least qualified, either by training or experience, to voice an opinion, while you could always get a decision pro or con from the medical profession.

With the coming to these shores of the great Finnish Olympian, Paavo Nurmi, long distance running in the United States grew in popularity. The methods of the Finn brought results and knocked into a cocked hat our soft system of training for long distances. It killed once and for all those windbags who for years kept us in the class of the "pussy foot," with their fears of over-emphasis and the dangers of hard work.

Nurmi taught us to work hard. He, himself, followed the toughest kind of a schedule and, while we recognize the value of the warm-up, the extent to which the Finn carried it was a revelation.

When Paavo first visited this country, he located in New York City. Shortly after his arrival, he came to see me with the request to train on our New York

*An article written by Conrad Jennings in the May 1934 issue of the ATHLETIC JOURNAL has some excellent pictures of the starting form of Ralph Metcalfe.—Editor's Note.

University Ohio Field. His subsequent practice was carried out in semi-seclusion.

Like so many of his countrymen, Nurmi was a hard man to approach. The Finns, like our American Indians, are a stolid type and Nurmi was no exception. I paid very little attention to his coming and going and unwittingly gained his confidence. Eventually this developed into a warm friendship and I feel Nurmi was closer to me, at that time, than to any other American.

I have learned something good, bad, or indifferent from every man who has ever come under my tutelage and there was much I learned that was good from this Finn—who was his own coach and trainer; a difficult assignment for any athlete, no matter how great.

And now a word about how Nurmi trained, back in the middle '20's, when he cleaned up all the opposition that could be mustered to stop his record-breaking achievement. Briefly, the Finn put in nine to ten hours in every twenty-four sleeping. His diet was mixed. Well-cooked meats and fresh vegetables with an abundance of fish foods and oils, three times a day, made up the menu.

Nurmi often worked out three times a day, seven days a week. The morning practice was devoted to long distance running on the cinders, or eight to nine miles cross country. The afternoon program was devoted to sprint work on the track, while in the early evening he would go indoors for middle-distance striding on boards. On the nights of his appearances in our big indoor meets, Nurmi would work out on cinders in the early afternoon. The warm-up preceding his competitive effort consisted of forty-five minutes to an hour, jogging, striding, and sprinting. In all practice and training Nurmi dressed exceedingly warmly, covering every inch of his body, except his face.

Following Nurmi's competitive tour of the states, we became long-distance-running conscious and this state of mind was productive of the great Hahns, Congers, Venzkes, Romanis, Bonthrons, Fenskes, Cunninghams, and now the Mehls, Rices, and MacMitchells.

When Glenn Cunningham came to New York University to study for his doctor's degree, he did all his training on Ohio Field where I had every opportunity to study him. Glenn's training, in one of his very best years, leads me to state that he made much of cross-country running. Throughout the fall season, from September to Christmas, he could be seen on New York's Van Cortlandt Park trail daily, regardless of weather conditions. With continued change of pace to meet the ground conditions, dressed in heavy underclothes, sweatsuit, woolen gloves and socks, heavy basketball sneakers, and woolen hood he would jog, stride, and sprint over distances from six to twelve miles.

On the track Cunningham would warm up with a 10:15 two miles and then proceed with pace, speed and jog workout, over varying short and middle distances. Glenn never ran the mile in practice, and he changed his program from day to day. As an example, on one day he would run quarters by the watch as follows: 1st quarter—jog slow; 2nd quarter—58:00 or 60:00; 3rd quarter—jog slow; 4th quarter—58:00 or 60:00; 5th quarter—jog slow; 6th quarter 54:00 or 55:00.

On another day he would run 660 yards for pace as follows: 660 yards—pace; rest, jogging or walking; 660 yards—pace; rest, jogging or walking; 660 yards—pace; rest, jogging or walking.

Now and then Cunningham would mix in a three-quarter mile run, for pace and time. After his first year of training on Ohio Field, Glenn could call his time at any distance within one second.

Nurmi, at twenty-six years of age, fluctuated in weight between 146 and 152 pounds. This was one of his greatest years. Cunningham, at twenty-six, tipped the beam at 156-158 pounds and MacMitchell, now in his twenty-first year, scales 161-165 pounds. It may be of some interest to students of the game to know MacMitchell's pulse rate is 44 and has been as low as 32. However, this low pulse rate should not weigh on the mind of any aspiring athlete with a 72 pulse for I have had great performers with pulses well over 72.

"MacMitchell the Iron Man," is just another sports scribe's designation. Doubtless the title was inspired by Leslie's ability to negotiate several good races in a single meeting. Now, there is nothing strange about any young athlete, when properly prepared beforehand, running two, three, or even four races in a meet. It is all a matter of hard work. Granted the athlete has enjoyed the proper build-up, the only two points stressed are: That there must be a sufficient lapse of time between his competitive efforts for a normal recuperation; That it is wiser to come down the scale—meaning, by this, the longer route should be the initial effort, the succeeding races shorter.

But be that as it may, Leslie is no iron man. He is just a hard-working boy who follows instructions to the letter. He had a good high school coach in Tommy Greenwald and I have brought him along slowly for the past three years. All things being equal, MacMitchell should reach his peak sometime during the next three years. Racing strategy comes with time. At present Leslie carries a heavy mental load—for you must know, gentlemen, he is a student—while a string of unbeaten successes is, psychologically, also a weight of considerable proportions, especially to a highly sensitive nature. However, he is a great boy and a fine athlete—what more can be said?

TRAINERS JOURNAL

SECTION

THE NATIONAL ATHLETIC TRAINERS ASSOCIATION

APRIL, 1942

No. 8

Official Publication
Of the National Athletic
Trainers Association

The Sore Arms of Baseball
—Their Treatment
Frank J. Wiechec

Co-ordination of the Move-
ments of Breathing and
Running
Albert E. Lumley

Knee Injuries
George Brent Fielding

Homer H. Horton, Athletic Director and
Football Coach
Lil Dismitt, Baseball Coach and Trainer
Texas Agricultural and Mechanical College



THE TRAINERS JOURNAL SECTION

Official Publication National Athletic Trainers Association

April, 1942

No. 8

Officers National Athletic Trainers Association
For 1941-1942

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1st Vice-President, John Kelly, New York University
2nd Vice-President, Henry Schmidt, Santa Clara University
3rd Vice-President, Wilbur Bohm, Washington State College
Executive Secretary and Editor of Trainers Journal, Bill Frey
Office of Publication, Iowa City, Iowa

The National Athletic Trainers Association Annual Meetings

THE programs are now set up for the two meetings of the National Athletic Trainers Association. The Western division will meet at ten o'clock, Friday evening and nine o'clock, Saturday morning, April 24 and 25 at Hotel Fort Des Moines, Des Moines, Iowa. The Eastern division will convene at ten o'clock, Saturday, April 25, in the University of Pennsylvania training quarters.

The election of officers for next year will be held at both division meetings. The nominations as received at this time follow. If others are received before the meetings, these will be added to the list.

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HARRY EVANS, St. Benedicts College
ROBERT SHELTON, University of Colorado
MIKE STANG, Rutgers

The High School Student Trainers Program, as sponsored by the association will be explained in detail and plans will be formulated for extending the program next year.

The meetings are open to trainers, coaches, directors and all interested in the physical fitness program of today.

—Bill Frey.

UNDER THE SHOWERS



RECENTLY appointed chairman of the Central Athletic Conference, Harry Evans has the right idea in enlisting the high schools for the student trainers' program offered by the National Association. At the big physical education meeting soon to be held in the state of Kansas, he is going to have a booth where will be found membership blanks, journals and descriptive matter of this plan for the coaches. Mr. Evans holds a class for men who are joining the armed service, helping them to get in perfect physical condition before they enter. Evans is assistant football coach, trainer and director of intramurals at St. Benedict's College, Atchison, Kansas.



AT the time of our first meeting Jack Heppinstall made himself known by his enthusiasm to do every job needed to make the association click and he has continued to give us a big hand ever since. Jack received his education in Great Britain and, as a member of the old school of training, came up the hard but the sure way. He has had great success keeping the Michigan State boys in the game. Heppinstall is one of the trustees of the association and was appointed president of the N. A. T. A. the second year of its existence.



NOW head trainer at the University of Toledo, Thomas M. Fitzgibbons has had a great deal of background in his chosen profession. He began as a student trainer at the University of Wisconsin in 1928, where he worked for the present trainer of the Golden Bears, Bill Fallen. He then took the position of recreation director in his home city, Milwaukee. In 1936 he returned to Wisconsin to become assistant to Tom Jones, track coach. After getting his master's degree in physical education, he returned to Milwaukee, this time as director of athletics and coach of all sports at the Milwaukee School of Engineering. In the fall of 1941 he became head trainer at Toledo University.



HEAD track coach and trainer at Colby College, Waterville, Maine, Norman C. Perkins was appointed chairman of the Eastern Intercollegiate Track Meet to represent the National Athletic Trainers Association. You Eastern trainers should make plans to meet with Perkins at the conference track meet this spring. I quote from his letter: "I am heartily in favor of the program which our association is sponsoring in college and high school work."

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The Sore Arms of Baseball— Their Treatment

By Frank J. Wiechec
Athletic Trainer, Temple University

BASEBALL training camps are now in full swing in the South. Soon college and high school teams will be limbering arms and legs and getting in shape for a successful year. A good season depends, to a great extent, on the condition of the players, and especially on that of their arms. Sore arms are the bane of most players, and in 90 per cent of cases, occur at the beginning of, or during, the spring training season. Without a doubt a sore arm is the most serious injury in baseball. It either "lays a player up" for weeks and months or it ruins his baseball career entirely. Such famous players as "Dizzy" and Paul Dean, "Schoolboy" Rowe, Wes Ferrel and John Babbich had their careers cut short because of sore arms and every year many promising school players "throw their arms out" even before the first game has been played.

Players complain of soreness either in the elbow or shoulder joints. There is a great difference of opinion among trainers and physicians concerning these two injuries. Such eminent authorities on athletic injuries as Heald, Bilik, Thorndike and Deaver disagree as to the location of these injuries and the type of involvement. Most treatment procedures advocated for both types of injury consist of some heat, massage, and rest for varying lengths of time.

In my opinion, such general treatment procedures are unsatisfactory. All too often an athlete comes to the trainer, points to his arm and says it's sore, stiff, or can't be moved. The trainer looks at it, and if he sees no cut or swelling, puts a heat lamp or diathermy on it, and lets it go at that. A little rub after thirty minutes of heat, and the treatment is over with the trainer hoping that the part is cured. Since it is agreed that the site of injury is, in most cases, the attachment of the muscle or its fascia to the bone, ordinary heat treatments and massage will have little effect on these injuries. Infra-red heat at best will not penetrate more than one-sixteenth of an inch and diathermy is usually not given long enough to produce any benefits. Massage, if applied properly, can be beneficial but this does not mean just a general rub over the area. An injury, no matter how trivial, deserves a careful examination, a cautious diagnosis and a well-thought-out regime of treatment. Failure to do this is one reason why injuries to the arm respond so

poorly to ordinary treatment.

Shoulder Injuries (Glass Arm)

The usual complaint in shoulder injuries is of aching in the upper arm and difficulty in raising the arm above the shoulder. There is no limitation of movement, although pain is experienced when the arm is put behind the neck or across the small of the back. At night the ache, like that of a sore tooth, becomes more severe, frequently causing sleeplessness. If the patient falls asleep, he will awaken with pain if he happens to roll on to the affected side. In the so-called Glass Arm, the usual theory advanced is that the synovia of the tendon of the long head of the biceps has been irritated and thus inflamed. The author concurs with the belief of Thorndike that the teres minor and major have been involved. Careful digital examination of the shoulder during the acute stage produces excruciating pain deep in the humerus near the insertion of the teres major and minor. Examination, if continued along these muscles, will reveal tenderness along their lengths even up to their origin.

Treatment: Treatment should be the same whether the biceps or the teres muscles are affected. The back and front of the shoulder, as well as the arm, should be heated until the part is relaxed and a good hyperemia appears. For general heating effects, I find that the whirlpool bath is most effective. The entire part can be immersed at one time and increased circulation is assured throughout the area.

Since the effects from this are not penetrating, local and concentrated heat must also be provided. For local heating the spark-gap diathermy is preferred to short-wave, because the deep heat effects can be more easily concentrated over a small area. Following diathermy, a deep friction type of massage should be attempted. The painful area should be worked on, using the thumb or two fingers in an effort to break down the adhesions or nodules usually found there. This type of massage is painful and leaves the arm in a sore and tired state, but even though it is severe, the results according to my experience have been quite satisfactory.

For the first week the routine should include at least two treatments a day by the trainer; later as the part responds to treatment, once a day will suffice. The afternoon treatment should be gentle and

relaxing and have as its aim the relieving of pain from the morning workout. A thirty-minute short-wave treatment with the induction coil followed by a ten-minute deep sedative massage and gentle passive movements of the joint will suffice. In the evening a hot pack or electric pad placed over the shoulder will keep it warm and relaxed until the next treatment.

Elbow Injuries (Pitcher's Elbow)

Soreness in the elbow usually follows a sudden violent wrench, or prolonged strain of the forearm. There is aching in the outer side of the elbow which is most marked in certain movements, unnoticed in others. The pain tends to get progressively worse with use until, in severe cases, a feeling of soreness is constantly present. It is painful to supinate the wrist and throwing the curve ball is the exercise that produces the pain. The pitcher's elbow or tennis elbow as it is more often called, will invariably show spasm and pain after a game, usually over the supinator longus and brevis, brachio radialis and extensor carpi radialis muscles. The region of the external condyle will show tenderness on pressure and, when the elbow is extended with the forearm fully pronated, the typical pain will be elicited along the forearm.

Treatment: The treatment of pitcher's elbow depends on whether it is recent or chronic. In a recent injury, after pain and bleeding have stopped, treatment measures should be instituted as soon as possible, in order to prevent the formation of adhesions. Again the treatment of choice is the whirlpool bath. The arm should be immersed for thirty minutes. While it is still in the bath, massage should be given underwater to the area injured. Massage will be more beneficial when the joint is in a relaxed position. The deep tissues may be reached and manipulated without causing pain or tension. After the heat treatment an analgesic pack should be wrapped around the elbow and the elbow kept warm and at rest until the next treatment.

It is the chronic elbow injury which responds so unsatisfactorily to treatment. Nearly always it is the result of neglect of adequate early treatment. Muscle spasm adhesions, contractures and poor circulation all are found in a chronic joint, and routine heat and massage hardly have any effect on the injury. Strenuous measures must be taken. These include the use of

whirlpool and diathermy, each for thirty minutes, to assure deep heat and adequate circulation. The sinusoidal current is next applied, using the Bayumi technique as outlined by Heald. This current exerts

an effective pull on the adhesions by virtue of its great strength and long continuance. The treatment is then brought to a close by the application of a deep sedative massage over the arm and elbow.

Co-ordination of the Movements of Breathing and Running

By **Albert E. Lumley**
Track Coach, Amherst College

THIS investigation was started during the summer of 1931 in the psychological laboratory of Oberlin College. Professor Raymond H. Stetson, then head of the psychology department, furnished the facilities of the testing laboratory and spent three months of his own time in promoting this study. Professor C. V. Hudgins of the Clark School, of Northampton, Massachusetts, and A. W. Hubbard of Reed College, Portland, Oregon, have also made many contributions during the last ten years.

Walking and Running

When a man walks, we all know that he tends to fall forward, but by placing a foot forward and the opposite arm, he catches himself and then does it again with both feet in contact with the ground. When he runs he makes the same sort of movements, but keeps only one foot in contact with the ground, evidently leaning more to the front and pushing harder off of the back leg.

Breathing While Running

When a man runs, the abdominal muscles perform two functions simultaneously; namely running and breathing. While he is running, the abdominal muscles must give postural support to the pelvic girdle, to which the leg muscles are attached. Since at the same time breathing increases both in rate and in amplitude, the abdominal muscles become also very important muscles of respiration. It is the purpose of this paper to find out how this mechanism performs these two functions.

The following muscles are used in inspiration: diaphragm, external intercostals, internal intercostals, sternocleidomastoid, scaleni, serratus posticus superior, transversalis and serratus posticus inferior.

Another combination of muscles are used in expiration: rectus abdominis, external oblique, internal oblique, transversalis, serratus posticus inferior and latissimus, and perhaps the iliocostalis and the quadratus lumborum. Hamburger would also add the internal intercostals, but this is a doubtful point.

A graduate of Michigan State Normal College, where he participated in track, football, boxing and baseball, Mr. Lumley served as director of intramural athletics at Oberlin College from 1925-28. Since then he has been director of intramural athletics, head coach of track, cross country and hockey at Amherst College.

Running-Breathing Co-ordination

We all know that many of these so-called breathing muscles take a very active part in this business of running: fixating the chest and abdomen, holding the torso more or less rigid and elevating the legs.

If these statements are true, then when a man runs and breathes, he must develop a co-ordination of the muscles for this double duty. He is probably not aware of this co-ordination but if he is a good runner he must have a better co-ordination than a poor runner. From what I know of the breathing-running set-up I am willing to state that there is a co-ordination of breathing while running and of course we can teach it.

The Lungs

In man the lungs, the organs of external respiration, are built in the following way. The trachea, or windpipe, a wide tube about four and one-half inches long, divides into two main branches or *bronchi*; these subdivide again and again, becoming gradually smaller. The terminal ramifications, or *bronchioles*, open into rather wider parts, the *infundibula*, the walls of which are beset with a number of minute cavities, the *alveoli*. The *alveoli* are the special respiratory parts of the lungs.

We can breathe fast or slow, but we must remember that the movements of inspiration and expiration call for the use of a large number of the muscles needed in the running movements. Normal man breathes 17 or 18 times a minute but the rate is set by the needs of the organism. He may normally take in from 25 to 30 cubic inches of air but he can easily take in 125 or 130. According to Seaver the breathing capacity of the average college

man is 253 cubic inches.

Training and Breathing

Training for one week will increase the load carrying ability of the lungs but the full effect is only observed after from five to seven weeks. In other words it should take us about six weeks to get the breathing apparatus of a man ready for a race.

Breathlessness

We are seldom astonished by things which we, as coaches, see every day, and it seems natural to everyone that a man should be out of breath when he has been running. But if we think about the matter there is something surprising in the phenomenon of breathlessness while running; when we run the legs do the work and the lungs become fatigued.

Perhaps you remember the old saying, "A horse trots with his legs and gallops with his lungs." This is a true saying and can be accounted for by the fact that in trotting the horse rapidly uses a few leg muscles which produce local fatigue, while during the galloping action many muscles all over the body are used, thus producing breathlessness before muscular fatigue. Men do not trot in races, they tend to gallop.

It may be stated that breathlessness is a feeling or distress which is produced during violent exercise or intense muscular work, and it is characterized by an exaggeration of the respiratory need, and by profound disturbance in the functions of the respiratory organs. This state is merely a peculiar form of dyspnoea and presents the general phenomena due to deficient aeration of the blood. We also discovered that during breathlessness it is not hard for a runner to inhale air, but that the exhaling of air is a very difficult matter. Personally I think this ties up with the fact that the rectus abdominis and the oblique muscles are busy with the running mechanism.

Muscular Training

Muscular training, especially exercises of endurance, improves the quality of the

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muscles so that they produce less waste, and it also increases the capacity of the heart, and lungs to take care of the increased demand. If the amount of muscular work be increased beyond the rate of elimination, acute general fatigue or breathlessness is inevitable, even if the man be in the best possible condition.

Muscle Soreness

Let us consider a statement made by Galen in the second century. "If anyone immediately after undressing proceeds to the more violent movements before he has softened the whole body and thinned the excretions and opened the pores, he incurs the danger of breaking or spraining some of the solid parts, but if beforehand you gradually warm and soften the solids and thin the fluids and expand the pores, the person exercising will run no danger of breaking any part."

We can now state that there is another cause of muscle soreness and that is the presence of irritating waste matter imperfectly carried off by the blood stream and the lungs.

Muscular Fatigue

Absolute muscular fatigue cannot be obtained outside of a laboratory but all of us have seen athletes suffering a painful sensation just before muscular fatigue sets in. The athlete shortly loses the power to control a fatigued muscle. We can state that the phenomenon of fatigue is related to four orders or causes:

1. Material lesions of the motor organs;
2. Auto intoxication by the waste-products of work;
3. Exaggerated use of the living tissue;
4. Dynamic exhaustion of the motor elements.

The Heart

During all of these tests we kept an accurate record of the heart action by the use of a Wiersma hand plethysmograph. We can state that a trained man can perform a given amount of work with a smaller consumption of oxygen than an untrained man; and that he, therefore, makes a smaller demand on his heart. The normal pulse rate ranges from 50 to 90 beats per minute but after running we may find that it has increased to 180 or more beats per minute. Trained athletes have a more regular heart beat than untrained men.

The heart rate of trained men is usually six to eight beats lower than in the same men out of condition.

In long distance races the oxygenation of the blood and the demands of exertion keep pace. The breathing becomes abdominal. The peripheral arteries fill and the heart beats more fully. In this condition we might say that fatigue is not due so much to oxygen hunger as to gradual fa-



Illustration 1—Side view of treadmill used in this experiment.

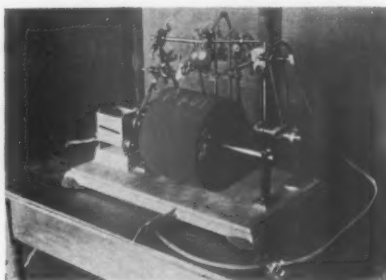


Illustration 2—View of kymograph and recording apparatus.



Illustration 3 shows the bound hand containing the Wiersma hand plethysmograph used to record heart rate.

tigue of the cardiac muscle.

Heart tests made during the last ten years seem to show that one of the practical things that we can do as track coaches is to take the pulse rate of every boy in our school or college. Those with low pulse rates of 54 or less standing should make good distance runners. (One good example, MacMitchell of N.Y.U., with 38 beats per minute.)

Second Wind

The initial dyspnoea produced by strenuous exercise is accompanied by a disturbance of the normal acid-base balance of the blood and tissues. The relief of second wind is probably the result of the adjustment toward a new equilibrium of the various mechanisms engaged in the

supply of the much needed oxygen to the active tissues. These adjustments involve primarily the circulatory and respiratory systems, but adjustments must also be made in the muscular and heat-regulating mechanisms.

When the exercise is very strenuous, the new equilibrium may be such that each of these systems is functioning at its maximum capacity. Under these conditions, oxygen is being supplied to the tissues and carbon dioxide being removed from them at about the maximum possible rate, while the lactic-acid content of the tissues is held at a relatively low level. The alveolar carbon dioxide falls below that present during dyspnoea, the tissues become less acid, pulmonary ventilation is decreased, the pulse rate is diminished, and perspiration begins, thus effecting a greater heat loss from the body and the bodily efficiency rises.

The initial dyspnoea may be diminished through training.

Second wind is common among experienced runners but almost unknown to the average citizen. Some professional track coaches say that second wind does not exist. They are partly right, because some runners never experience its benefits. It is, however, safe to say that the phenomenon known as second wind, by which the runner experiences a sudden relief from the agony of breathlessness, is a readjustment of elimination to the increased production of waste.

Field Observations

After studying the black sheet records made while the subjects were running on the treadmill, we definitely found a breathing-running co-ordination of one breath to two pairs of steps. With this in mind, we decided to make field observations on our subjects while they were running on an outdoor track. We used an open car and rode directly at the side of the runner. One of us counted left foot steps, another breaths by listening to the inhalations and exhalations. (Notice we did not count the rise and fall of the rib cage because it does not make any obvious movements.) Another man acted as recorder and a fourth as driver. These observations proved to me that good runners breathe at the rate of one breath to every two pairs of steps as long as they possibly can. Poor runners seem to have a hit-and-miss system of breathing and running, or no system at all.

I am convinced that almost all of our good runners have a co-ordination of breathing and running. If this is a true statement it seems to me that we should interest some one like our own war department in conducting tests on soldiers. If we could prove in thousands of cases that men can be taught to breathe efficiently while running, walking, or marching, we certainly would make a contribu-

tion to the efficiency of our army as well as to that of our athletic teams. Swimming coaches seem to be a few jumps ahead of us in this matter of breathing, but I think that they have missed some of the very important possibilities of co-ordinated breathing.

Discussion of Results

From the above results one can see that the running mechanism is very complex. It involves not only the legs, the action of which is centered about the hip-joint, but the entire group of abdominal muscles. Since the abdominal muscles are so important for running, this experiment demonstrates that the running co-ordination modifies breathing; and since breathing is so important to running, the experiment shows that the runner must in some way make the two conflicting co-ordinations work together. We believe, then, that the ability to make this co-ordination is what distinguishes a good from a poor runner. Strength of leg muscles is important for the runner; but it seems to us that the most important thing is the working together of the breathing-running co-ordination. This is especially true for the distance runners. With sprinters this breathing-running co-ordination is not a primary issue. A man will probably breathe once or twice in a hundred-yard dash; but our records show that in running longer distances, he will breathe approximately at the conclusion of every two pairs of steps and, as he becomes fatigued, at the conclusion of every pair of steps. In a distance race this eventually calls for a breath at the conclusion of approximately every twelve feet covered.

A possible clue to the immediate cause of a stitch in the side lies in the fact that there is not a co-ordination between the breathing-running mechanism and the two are in conflict. Perhaps one of the chief factors in so-called second wind lies in the fact that the runner has resolved this conflict and that there is now a co-ordination between the breathing-running mechanism. It is hoped that further work on this problem will explain second wind, but the data gathered so far seem to indicate that the conclusions as suggested are sound. Some men have a very definite feeling of second wind, but others have no such experience, although they are good runners. It is doubtful as to whether a well-trained man would have this experience because a very vital part of his training, whether he knows it or not, consists of his bringing in line the two conflicting mechanisms and he probably often starts out a race with second wind.

There are many causes of breathlessness, but we have come to the conclusion that one of the important reasons for this phenomenon is the non-co-ordination of breathing and running that is common to so many athletes.

We can state that fatigue while running can be definitely postponed by the use of

an habitual breathing-running co-ordination.

We have studied the heart action while the subject is reclining, sitting, and standing, as he begins to run, and during breathlessness, fatigue, and recovery. We can state from this experiment that the heart is noticeably affected by each of these conditions, and that a breathing-running co-ordination allows the heart to make regular movements that will help retard fatigue and breathlessness.

Summary

1. The records show that running modifies the breathing mechanism and that the fixation of the abdominal muscles in the performance of their function of postural support of the pelvic girdle for the run-

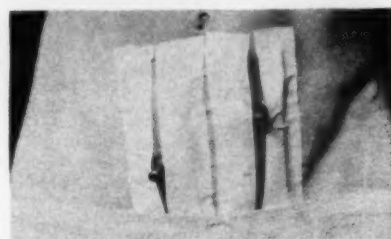


Illustration 4—Pads taped on the two columns of the rectus muscles, used to record the movements of the lower segments of the rectus abdominis.

Program of National Athletic Trainers Association Meeting Eastern Division

1. Informal meeting of trainers in the University of Pennsylvania training quarters on Saturday, April 25th, at 10 A. M. The purpose of this meeting is to become acquainted with other trainers in the East and make plans for future meetings.

2. Educational meeting for trainers, coaches and others interested in athletics. This meeting is to be held at the University of Pennsylvania on Saturday, April 25th, at 11 A. M.

3. Round table discussions of the following subjects:

- Athletic trainers and their contribution to our present war effort. A discussion of the branches of service for which trainers are best suited.
- Track injuries—their protection through adhesive strapping.
- Knee, ankle and shoulder injuries—their treatment and prevention.
- Program for high school trainers.
- The advantages of membership in the National Athletic Trainers Association.
- Colds on the squad—their treatment.

4. Election of officers in Eastern section of Trainers Association. Chairman, Frank Wiehce, Temple University.

ning mechanism tends to fixate the chest and thus interfere with its expansion.

2. Evidence is presented which indicates that the runner may work into a convenient co-ordination of these two conflicting mechanisms and it is suggested that this fact may be a clue to second wind, and that the stitch in the side may be due to the inability of these two mechanisms to work in unison.

3. Records of the heart rate show distinct differences between trained and untrained men. They also show that the heart rate is definitely affected by the breathing-running co-ordination or by lack of it. Further work on this problem is proposed.

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Knee Injuries

By George Brent Fielding
University of New Hampshire

IN my opinion, knee injuries are the most dangerous in football. The time lost from game play and the classroom, due to this injury, by far exceeds any other in athletics.

In this injury, like many others, many of them might have been prevented. This is one of our first considerations. It then becomes the duty of the coach, as I see it, to devote a good portion of the pre-season conditioning period to specific exercises which will strengthen the knees. This is especially true of the linemen who are apt to get knee injuries, due to mousetraps and clips in the line. Each coach should make himself familiar with the anatomical structure of the knee joint so that he may deal more effectively with the problem of knee injuries.*

As a measure of prevention I have listed some simple exercises in the paragraphs to follow that have given me some good results. These exercises are both preventative and corrective in nature, they may

*Anatomical structure of the knee joint was discussed by Frank D. Dickson, M.D. in the October and November issues of the Trainers Journal.

High School Trainers Lesson No. 8

AMONG the many educational features emphasized by the National Athletic Trainers Association is the dissemination of knowledge relating to training problems among the high school coaches by athletic trainers of the colleges and universities. The many high school coaches who have to serve both as instructors of coaching techniques and as trainers of their squads have welcomed this information. The University of New Hampshire has done an excellent job in giving to the high school coaches of that state a series of informative articles on the various phases of athletic training. In the March issue Lil Dimmitt of Texas A & M wrote of that institution's close co-operation with the coaches of that state in furnishing information on training questions by telegrams when immediate replies are needed.

Mr. Fielding, author of this article, is freshman football coach and varsity tennis coach at the University of New Hampshire.

be used for both.

1. Place the hands on the hips and flex the knees. In a squat position, walk to the side and the front imitating the duck walk.

2. Flex the knees and place the hands on the ground inside the knees. *Movement:* Jump to stride standing and fling the hands to the side. Repeat ten to fifteen times.

3. Flex the knees and place the hands on the ground outside the knees near the toes. *Movement:* Extend the leg to a horizontal position; hold for five seconds and return; repeat with right and left legs ten to fifteen times.

4. Lie flat on the back, legs straight. *Movement:* Move the right leg and rotate it in small circles inward, repeat with the left leg ten to fifteen times.

5. Lie flat on the stomach; legs straight. *Movement:* Move the legs up and down using the chest as a rocker in much the same motion as the flutter-kick in the pool, three minutes.

6. Lie flat on the back. *Movement:* Raise the right leg to a perpendicular posi-



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tion and bring it over the body until it touches the ground. Keep both shoulders flat on the ground. Repeat with the left leg. Repeat ten to fifteen times with each leg.

7. Stand in an upright position. *Movement:* Without bending the knees touch the hands to the ground. Repeat ten to fifteen times.

8. Lie flat on the back. *Movement:* Raise the legs to a perpendicular position over the body, grasp the toes and rock back and forward, three minutes.

9. Assume an upright position. *Movement:* Place the right foot on the edge of the training table, grasp the right knee with the hands and arms; push up with both legs extending a downward pressure on the right leg.

10. Place both feet against a stationary object. *Movement:* Use an imaginary rowing stroke, bending both knees and bringing the arms down over the toes.

Having discussed briefly the types of exercises we might use to prevent knee injuries, we can begin a discussion of the knee and the factors that cause injury.

In dealing with joint injuries, we must remember that we are dealing not only with the joint but the structures surrounding it as well. Injuries to these parts, while painful and perhaps resulting in disability, have little chance of resulting in permanent injury. Our chief consideration is with these parts, which go to make up the joint and which are most frequently left in a damaged and unstable condition following a recovery.

The parts most often damaged, which are most likely to cause disability are: 1. The lateral ligaments (internal and external) and 2. The semilunar cartilages (internal and external).

Injuries to the lateral ligaments: The lateral ligaments are two in number (internal and external) and are located without the joint at a point near the center

of the internal and external sides of the knee. They are anchored to the tibia (shin bone) and the femur (thigh bone).

The external lateral ligament is seldom sprained and unless the injury is very severe, it does not cause any great degree of trouble.

The internal lateral ligament, on the other hand, is very often sprained and twisted. The injury usually happens as the knee is forced inward, while the lower part of the leg is either fixed or forced outward. This type of movement forces the internal side of the joint to expand beyond its optimum range. This results in a strain or a rupture of the ligament.

The following symptoms are evident in a diagnosis: 1. There is pain on the inner side of the knee. 2. Pain is caused by forcing the knee inward and the foot outward. 3. There is tenderness on pressure confined to the line of ligaments. 4. The knee did not lock, this suggests a ligament injury.

Injuries to the Semilunar Cartilages: The semilunar cartilages, two in number—internal and external—are located within the knee joint. Due to their shape and attachments, the internal cartilages are more frequently injured than the external.

The mechanism of the injury to the internal semilunar cartilage is nearly always the same. The ankle bends inward, the force bends the leg inward while the inner side of the point is open, the upper part of the leg is twisted upon the lower part, causing a grinding movement of the joint. This usually forces the internal lateral ligament to give away. As the inner point of the knee joint opens, the semilunar cartilage, which is strongly attached to the ligament, is pulled out of its socket. When the pressure is released on the knee, the joint snaps shut and pinches the cartilage. Sometimes it is just bruised and it slips back in its proper position. In the typical case the cartilage is split or broken or the

end is nipped or folded over, so that some part of it does not get back into its proper place.

The symptoms which follow are evident in a diagnosis: 1. The knee usually locks or has been locked. 2. Tenderness over the injured lateral ligament. 3. Tenderness over the upper edge of the tibia. 4. Pain and tenderness on the posterior side of the knee.

Having briefly outlined what happens in a joint injury, we are ready to begin a discussion as to how we may treat an injury to the knee joint.

Our first consideration is to make sure that there is no fracture. We always insist on an X-ray. After we have made a preliminary examination, the following procedure is recommended. We wrap the leg in cotton and bandage with gauze. We then begin to apply ice cold water to the knee and continue this treatment until the skin under the gauze becomes white and wrinkled. At this stage the cold has served its purpose, that is, the checking of effusion into the joint.

The wet coverings are removed. A light coat of analgesic balm is put over the knee joint, and covered with cotton, then wrapped with an elastic bandage. This is done to insure heat in the joint and to keep it from getting stiff.

The athlete must be kept off the leg. After a twenty-four hour period we begin to use the whirlpool bath for twenty minutes a day. Then we give the knee a light massage, and apply an analgesic pack. We continue this treatment for five days. By this time the athlete should be able to walk. We continue heat treatment twenty minutes in length. To bear weight on the leg it is necessary for us to strap the knee.

If the athlete returns to competition it is necessary to strap the knee and have the boy wear a protective brace. I recommend the use of the Duke Simpson brace and I insist that the boy wear the brace at all times.

What the Schools Are Doing

(Continued from page 9)

can walk the miles, crawl the hills, tote the gun. It is the function of another class to teach him to shoot when he gets there.

Competitive Exercises; Modified Games

1. *Steeplechase:* A steeplechase course of about 1100 yards was laid out. It involves running in narrow rocky lanes, down a steep forty-five degree slope, up a shale cliff, over slick grass and a dump, across a creek. The finish is a one hundred yard-straightaway up a long grade. This course is used, for the most part, to alternate with the barricade course. They are both rarely used on the same day. Time is taken on this course about every

week. This time serves as a rough indication of stamina.

2. *Relays:* One day a week, usually the last class day, the work is entirely devoted after the calisthenics to competitive work. Competition over the barricades, individually and in squads; competition over the steeplechase individually and in squads. The usual shuttle relays are much used. The course of the relay

THIS is the first program arranged especially as a war-time conditioning course, that we have been privileged to print. Other institutions may have worked out special courses. We shall be glad to have them written up for publication.—Editor's note.

is usually set so that there are one or more turns involved for each man. Relay in which every man runs fifty yards in two twenty-five-yard laps. Same relay in five-yard laps. Relays in which the men run the laps backward, on the hands and feet, hop, etc. The usual relay is modified by using a heavy medicine ball as baton.

The most popular and effective relays are those involving obstacles of some sort. Human obstacles are the most flexible so they are used the most.

a. Two squads form obstacles while two squads compete. Variation of the old game called Bombay is used. Three or more stands of three men each are made on a fifty-yard course. Squads compete

by making a flip over each stand on the way down the course and run back to the tip-off straightaway. Stands are made by placing two men, buttocks to buttocks, third man places head between the outside legs of the men, the right of one and the left of the other. He locks the stand by encircling one leg of each man with an arm. The runner catches this locking man at the hip and does a flip using the whole stand as a mat and balance at the same time. This is a very simple and safe way of learning to hit and roll. Incorporated into a relay, it makes for quick adjustment and good control.

b. Same relay as above but one more man placed some four to six feet from the stand. He is bent in leapfrog stance. This makes the runner use a quick two footed take-off for his flip, decreases his forward speed, and increases his control. Many variations of these ideas are easily worked out, the variety depending upon the number of men available to make the stands and the imagination of the instructor.

Games: Games, as such, are not used very much as they are usually based upon the idea that a game should be played between fairly equal forces. It has been our attempt to modify the games so that the men could operate under adverse conditions, conditions where the odds are stacked against them, conditions that call forth ingenuity and will power. This sort of game playing has brought forth the attitude on the part of the men that any one of them would take on the whole class if somebody thought that up.

Football, basketball and the like do not offer themselves to that sort of manipulation for two reasons. Tradition is probably the strongest, and the fact that the extra men would make it no contest. From this fact it became necessary for us to devise most of the games, for example: Battle of Singapore or Java or what. One squad is placed on a mat. The men must keep their hands and knees on the mat. Two squads are set to root them off with the same conditions prevailing, no hands, no standing. The third squad is held in reserve so that, if and when, the defenders of the mat make a good stand, they are thrown in against the stout defenders. This is rather rough, but if the conditions are adhered to, it is effective and furnishes exercise.

Tug-of-war with unbalanced sides, but the smaller side given the advantage of terrain and footholds.

All variations of what we call unfair games or Jap games build up individual initiative and call up the ability to work with whatever man power happens to be available at the time and place. All habitual pairings of men are broken up for this same reason. Each man should be able to work with any man who happens to be alongside at the time.

All these things have been explained in



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detail so that if any of them appear valuable, the means for their execution are readily available. The course as described is by no means crystallized. We are learning new things every day, gathering and sifting additional material, checking and re-checking progress. On the whole, we feel that we are on the right track, that we will be able to get the men not only in good, but excellent condition by the time they go into the service.

Medical Examinations for Boys of the 1942 Graduating Class in West Virginia High Schools

By Alden W. Thompson

Dean, School of Physical Education and
Athletics, West Virginia University

CURRENT reports indicate that the physical examination of selectees by army doctors is eliminating from military service almost 50 per cent of those who would otherwise be available. In World War I the figure was about 33 per cent and its disclosure resulted in a wave of state compulsory physical training laws the country over. Unfortunately, however, medical examinations to go with the physical activities were not required generally and money was not made available to provide necessary examinations and to make certain that the defects discovered were corrected. While present examinations are more stringent than in 1917 and also include a blood test, the high rate of rejection calls for action that will reduce it wherever possible.

Today, with man power and more man power needed to operate the mechanical weapons of war, we find among the leading causes of rejection from service *poor eyesight, poor hearing, and bad teeth*. All three are correctible to a considerable extent over a period of time. Rejection for general lack of physical capacity and strength is far down the list.

Even with increased attention to health and physical education in our schools during the past twenty years, the fact remains that funds have not been provided for periodic medical examination and the machinery necessary for corrections. Consequently we find ourselves almost as unprepared today as twenty-five years ago. In addition, industry now demands workers with the ability to pass a physical examination and we are in the all-out type of war in which civilians themselves undergo tremendous physical and mental hardship.

The need is obvious and great among both our school and general population for:

- (1) Immediate knowledge of the exact physical condition of those who

may be called soon to military service.

- (2) The correction wherever possible of discovered defects *before* army examinations and consequent rejection.
- (3) Similar activity among prospective industrial workers.
- (4) Increased recognition by the general population of the need for a high level of physical condition and stamina.

In our 267 high schools of West Virginia there will be graduated this year approximately 17,000 seniors. About half of them are young men ranging from seventeen to twenty years of age, with the average eighteen plus. Many of them will volunteer for military service by next September. All will be called by the Selective Service Act in the next two years. Industry will need many.

Discussion with school and medical personnel indicates that less than 5 per cent of these young men have had an adequate medical examination, comparable to that of the army, during their high school course. Athletes are checked over more than the general student body, but the passing of a medical examination is not mandatory for participation throughout the state. Many pupils are given a health examination before entering the first grade, but not all. Practice varies greatly after that. County health units do not exist in all counties and doctors and nurses must necessarily concentrate on immunizations and control of epidemics. Classroom and physical education teachers can assist and do cursory inspections but medical personnel is necessary for adequate examination. Knowledge of condition through examination means little without follow-up for correction, but correction will never occur without that knowledge of condition. West Virginia schools this year are serving total grade groups approximately as follows:

Elementary (1 to 6) 306,000 (including some seventh and eighth grade units); Junior high (7-8-9) 32,000 (inclusive of enrollment of six-year organizations); Senior high (10-11-12) 110,000 (including six-year organizations).

All evidence points to an average of not more than one *adequate* medical examination per pupil in the twelve years of common school work, with follow-ups varying greatly in effectiveness, and generally inadequate.

It is suggested that county superintendents and principals of senior high schools in West Virginia will be doing a patriotic service if they can arrange in some way to give every senior boy a graduating gift of a complete medical examination and then help him to have corrected such defects as may be discovered.

Basically the health needs of girls are just as great, but imminent military service undoubtedly gives the priority to

boys, if the examination program is not available to all. Most of these boys will have one or two years before actual military call. In that period corrections may be made and general physical condition toned up to war-time efficiency. The diploma testifies to mental ability and the completion of a knowledge program. A physician's certificate of physical condition would be a possession of great value in the face of the rigors of war service and would be a guide by which further personal physical progress could be planned.

The cost of medical examinations varies greatly throughout the state. In some communities individual physicians reduce their rates or even donate their services. In others, service clubs such as Rotary, Kiwanis, Lions furnish funds for examinations or corrections, or both. County health units are giving great service in the face of large jobs and small staffs. Man power today, however, is a national asset and should be conserved at national or state expense, not left to chance or even individual initiative. Luther Poling, Director of Health Education for the N. Y. A. in West Virginia, reports that medical (including dental) examinations have been given to 6,000 out-of-school youth of high school age during the past eight months, 75 per cent of whom were high school graduates. The cost of these examinations, either by clinics or by individual physicians and dentists by appointment, averages less than \$2.50 each. On this basis, if similar costs could be worked out locally the total would be extremely reasonable in light of the national emergency. Approximately 8,500 boys from fifty-five counties will graduate in May or June of this year. If their examinations and consequent corrections reduced the rejections to one-half or one-third the usual rate, the difference might be the difference between victory and defeat, between life and death for some, between freedom and slavery for future generations. The value to our national defense effort could not be estimated.

It is suggested that each of the fifty-five county superintendents in the state discuss this matter with their boards of education and high school principals and seek (1) to provide a complete medical examination for each graduating senior boy by May 1, and (2) to counsel with him about getting started at once on a program of correction of whatever defects are discovered.

Many calls are being made upon you for your energy and time. All seek to build up the striking power of the United States in its fight for the right to live in a state of freedom and personal opportunity. Nothing is more important in that fight than man power. The man power of the America of tomorrow is in your schools today. Protect it and build it up to its highest efficiency.

Keep 'Em Rolling

UNDER this heading last month, we explained the tire situation as it affects school buses used for the transportation of athletic teams.

The following letter is a type of the inquiries reaching us:

"At this time, I would like to bring to your attention, and I dare say you have probably noticed it yourself, an apparent paradox.

"On the one hand we read of the drive to develop the physiques of our youth. We receive reams of material urging us to place greater emphasis upon physical education and athletics in the schools, colleges and playgrounds.

"On the other hand, we also read that our transportation facilities are cut drastically, thus depriving us of one of the strongest incentives for such physical development, that of interscholastic competition."

The secretaries of the various state high school athletic associations are working on the problem in the several states. The replies that we received on our questionnaire showed a most favorable comparison in the total amount of miles driven by school buses for school purposes and the total amount of miles driven in transporting athletic teams. From the coupons received to date, the average would indicate about three per cent. We are running this coupon again this month and urge coaches who did not return it last month to comply with our request. This information may serve a valuable purpose. No postage is required if the accompanying coupon is used. The information may be sent on a post card but must be signed. All reports will be held confidential.

A few of the reports received thus far are shown below.

	Total Amount of Miles Driven by School Buses	Total Number of Miles for Athletic Teams
California	30,000	500
Illinois	20,111	386
Indiana	23,500	475
Massachusetts	31,500	866
Michigan	31,640	1,500
Minnesota	47,425	1,050
Montana	2,160	1,500
Nebraska	15,000	450
New Jersey	26,182	640
New Mexico	28,800	10,760
New York	24,018	825
Ohio	18,000	1,000
Texas	40,000	780
Virginia	36,000	768
Wisconsin	38,500	2,500
Wyoming	31,000	1,300

for APRIL, 1942

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SHOES

Converse Rubber Co.	11	<input type="checkbox"/> Catalogue
Riddell, Inc., John T.	Cover	<input type="checkbox"/> Catalogue
Witchell-Sheill.	6	<input type="checkbox"/> Catalogue

CLOTHING

Kahnfast Satins.	3	<input type="checkbox"/> Swatch and names of manufacturers featuring these fabrics
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MEDICAL

Absorbine, Jr.	28	<input type="checkbox"/> Information
Denver Chemical Mfg. Co.	43	<input type="checkbox"/> Information on Antiphlogistine
Dolge Company, C. B.	31	<input type="checkbox"/> Brochure on Athletes Foot
Safe-Play Goggle Co.	34	<input type="checkbox"/> Information

RUBBER COVERED BALLS

Volt Rubber Corp., W. J.	35	<input type="checkbox"/> Catalogue
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BASEBALL AND SOFTBALL BATS

Hillerich & Bradsby Co.	19	<input type="checkbox"/> Catalogue
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BASEBALL BASES

National Sports Equipment Co.	35	<input type="checkbox"/> Folder
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TENNIS COURTS

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GAMES

Medart Mfg. Co., Fred.	31	<input type="checkbox"/> Information on Goal-Hi
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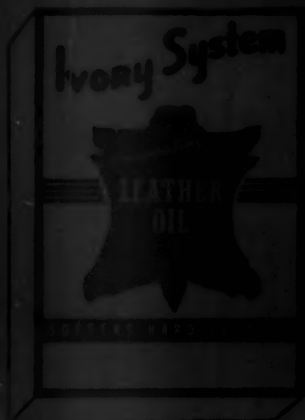
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